Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** Martinsville Connector (VDOT) Henry R3 02070010 3/01/2019 Α N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map SA, JB **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. to their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sediment deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. populations. than 10% of the reach. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

Stream Impact Assessment Form Page 2									
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
0.00	Martinsville Connecto	or (VDOT)	Henry	R3	02070010	3/01/2019	Α	0	N/A
4. CHANNE livestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer		ictions,
	Negligible	Mir	nor		erate	NOTES>>			
		1					/ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	is disrupted by any of the channel alterations listed in the parameter guidelines. If	6U - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% of by any of the chang in the parameter of	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



DESCRIBE PROPOS	SED IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** Martinsville Connector (VDOT) R3 02070010 3/01/2019 В N/A Henry Name(s) of Evaluator(s) Stream Name and Information Stream Map SA, JB Marrowbone Creek?? 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.2 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.20 Left Bank Lt Bank CI > 1.20 1.20 1.2 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. populations. than 10% of the reach. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

Stream Impact Assessment Form Page 2									
Project #	Project Name (App	licant)	Locality	Cowardin Class.	нис	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
0.00	Martinsville Connecto	or (VDOT)	Henry	R3	02070010	3/01/2019	В	0	N/A
4. CHANNEI livestock	L ALTERATION: Stream cross	ings, riprap, conci		concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,
				Moderate Severe					
	Negligible	Mi	nor		erate	Sev	/ere	NOTES>>	
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chang in the parameter of	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

INSERT PHOTOS:



DESCRIBE PROPOSED IMPACT:	DE	SCR	BE I	PRO	POSED	IMPACT:
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Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC Date SAR# Class length **Factor Martinsville Connector (VDOT)** Henry R6 03010103 3/28/19 Ε N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map Unnamed Tributary to Marrowbone Creek 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Marginal Suboptimal Poor Low Marginal: Non-maintained High Poor: ow Suboptimal High Suboptima Riparian areas Lawns, mowed Riparian areas High Marginal: lense herbaceou and maintained Low Poor: with tree stratum (dbh > 3 inches) vegetation, riparian areas with tree stratum (dbh > 3 inches) areas, nurseries Impervious ense herbaceou no-till cropland; surfaces, mine present, with vegetation with lacking shrub and Tree stratum (dbh > 3 inches) present resent, with 30% actively grazed spoil lands. either a shrub layer or a tree layer (dbh > 3 30% tree canop cover and a tree stratum, hay production, ponds Riparian with > 60% tree canopy cover and an non-maintained understory. Wetlands to 60% tree anopy cover an pasture, sparsely vegetated nonenuded surface **Buffers** row crops, active maintained open water. If containing both herbaceous and shrub layers or a maintained area feed lots, trails, or inches) present, with <30% tree understory present, tree recently seeded other comparable Recent cutover stratum (dbh >3 and stabilized, or conditions. (dense canopy cover. inches) present, with <30% tree non-maintained other comparable vegetation). understory condition. canopy cover wit maintained understory Low High Low High High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums descriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 100% 100% Right Bank Score > 1.2 CI= (Sum % RA * Scores*0.01)/2 100% CI % Riparian Area> 100% Rt Bank CI > 1.20 Left Bank Score > 1.2 Lt Bank CI > 1.20 1.20 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.60

RCI= (Riparian CI)/2 COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF



Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** Martinsville Connector (VDOT) R3 02070010 3/01/2019 G N/A Henry Name(s) of Evaluator(s) Stream Name and Information Stream Map SA, JB tributary to Marribone Creek 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 1.5 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.2 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.20 Left Bank Lt Bank CI > 1.20 1.20 1.2 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (Applicant) Martinsville Connector (VDOT)		Locality Cowardin Class. HUC		HUC	Date SAR #		Impact / SAR length	Impact Factor
0.00			Henry	R3	02070010	3/01/2019	G	0	N/A
4. CHANNEI ivestock	L ALTERATION: Stream cross	ings, riprap, conc		concrete blocks, s	traightening of cha	annel, channeliza			ictions,
	Neglinikle		Containona	ai Caleudi v					
	Negligible	Mi	nor		erate	Sev	/ere	NOTES>>	

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

CI

1.50

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

SCORE



DESCRIBE	PROPOSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** Martinsville Connector (VDOT) R3 02070010 3/01/2019 Н N/A Henry Name(s) of Evaluator(s) Stream Name and Information Stream Map SA, JB tributary to Marribone Creek 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 1.5 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. 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INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

	St	tream Ir	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (Applicant)		Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
0.00	Martinsville Connecto	or (VDOT)	Henry	R3	02070010	3/01/2019	н	0	N/A
ivestock	L ALTERATION: Stream cross		Condition	al Category				NOTES>>	rictions,
	Negligible	Mi	nor		Moderate Severe				
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	Idu - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not	Greater than 80% of by any of the chan in the parameter g 80% of banks sh	of reach is disrupted nel alterations listed juidelines AND/OR lored with gabion, r cement.		
				recovered.	recovered.				

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** Martinsville Connector (VDOT) R3 02070010 3/01/2019 N/A Henry Name(s) of Evaluator(s) Stream Name and Information Stream Map SA, JB tributary to Marribone Creek 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 1.5 2.4 2 1.6 1.60 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.2 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.20 Left Bank Lt Bank CI > 1.20 1.20 1.2 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

	Stream Impact Assessment Form Page 2										
Project #	Project Name (Applicant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor			
0.00	Martinsville Connector (VDOT)	Henry	R3	02070010	3/01/2019	J	0	N/A			
4. CHANNEL livestock	ALTERATION: Stream crossings, riprap, conc	rete, gabions, or o	concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,			
		Condition	al Category				NOTES>>				
	Negligible Mi	nor	Mod	orato	Sou	/OTO					

			Conditiona	al Category		NOTES>>	
	Negligible	Mi	nor	Mod	erate	Severe	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	of the channel	is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks shored with gabion, riprap, or cement.	
SCORE	1.5	1.3	1.1	0.9	0.7	0.5	

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

CI 1.50

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



DESCRIBE PROPOS	SED IMPACT:
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Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC Date SAR# Class length **Factor Martinsville Connector (VDOT)** Henry R6 03010103 3/28/19 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map Unnamed Tributary to Marrowbone Creek 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Marginal Suboptimal Poor Low Marginal: Non-maintained High Poor: ow Suboptimal High Suboptima Riparian areas Lawns, mowed Riparian areas High Marginal: dense herbaceou and maintained Low Poor: with tree stratum (dbh > 3 inches) vegetation, riparian areas with tree stratum (dbh > 3 inches) areas, nurseries Impervious ense herbaceou no-till cropland; surfaces, mine present, with vegetation with lacking shrub and Tree stratum (dbh > 3 inches) present resent, with 30% actively grazed spoil lands. either a shrub layer or a tree layer (dbh > 3 30% tree canop cover and a tree stratum, hay production, ponds Riparian with > 60% tree canopy cover and an non-maintained understory. Wetlands to 60% tree anopy cover an pasture, sparsely vegetated nonenuded surface **Buffers** row crops, active maintained open water. If containing both herbaceous and shrub layers or a maintained area feed lots, trails, or inches) present, with <30% tree understory present, tree recently seeded other comparable Recent cutover stratum (dbh >3 and stabilized, or conditions. (dense canopy cover. inches) present, with <30% tree non-maintained other comparable vegetation). understory condition. canopy cover wit maintained understory Low High Low High High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums descriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 100% 100% Right Bank Score > 1.2 CI= (Sum % RA * Scores*0.01)/2 100% CI % Riparian Area> Rt Bank CI > 1.20 Left Bank Score > 1.2 Lt Bank CI > 1.20 1.20 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.60

RCI= (Riparian CI)/2 COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF



Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC Date SAR# **Factor** Class length **Martinsville Connector (VDOT)** Henry R3 03010103 2/27/2019 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map Unnamed Tributary to Marrowbone Creek 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Marginal Suboptimal Poor Low Marginal: Non-maintained High Poor: ow Suboptimal High Suboptima Riparian areas Lawns, mowed Riparian areas High Marginal: dense herbaceou and maintained Low Poor: with tree stratum (dbh > 3 inches) vegetation, riparian areas with tree stratum (dbh > 3 inches) areas, nurseries Impervious ense herbaceou no-till cropland; surfaces, mine present, with vegetation with lacking shrub and Tree stratum (dbh > 3 inches) present resent, with 30% actively grazed spoil lands. either a shrub layer or a tree layer (dbh > 3 30% tree canop cover and a tree stratum, hay production, ponds Riparian with > 60% tree canopy cover and an non-maintained understory. Wetlands to 60% tree anopy cover an pasture, sparsely vegetated nonenuded surface **Buffers** row crops, active maintained open water. If containing both herbaceous and shrub layers or a areas maintained area feed lots, trails, or inches) present, with <30% tree understory present, tree recently seeded other comparable Recent cutover stratum (dbh >3 and stabilized, or conditions. (dense canopy cover. inches) present, with <30% tree non-maintained other comparable vegetation). understory condition. canopy cover wit maintained understory Low Low High High High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums descriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 95% 100% 5% Right Bank Score > 1.2 0.6 CI= (Sum % RA * Scores*0.01)/2 90% 10% CI % Riparian Area> 100% Rt Bank CI > 1.17 Left Bank Score > 1.2 0.6 Lt Bank CI > 1.14 1.16 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.58

RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >> N/A

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF



Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC Date SAR# Class length **Factor Martinsville Connector (VDOT)** Henry R3 03010103 2/27/2019 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map Unnamed Tributary to Marrowbone Creek 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Marginal Suboptimal Poor Low Marginal: Non-maintained High Poor: ow Suboptimal High Suboptima Riparian areas Lawns, mowed Riparian areas High Marginal: dense herbaceou and maintained Low Poor: with tree stratum (dbh > 3 inches) vegetation, riparian areas with tree stratum (dbh > 3 inches) areas, nurseries Impervious ense herbaceou no-till cropland; surfaces, mine present, with vegetation with lacking shrub and Tree stratum (dbh > 3 inches) present resent, with 30% actively grazed spoil lands. either a shrub layer or a tree layer (dbh > 3 30% tree canop cover and a tree stratum, hay production, ponds Riparian with > 60% tree canopy cover and an non-maintained understory. Wetlands to 60% tree anopy cover an pasture, sparsely vegetated nonenuded surface **Buffers** row crops, active maintained open water. If containing both herbaceous and shrub layers or a areas maintained area feed lots, trails, or inches) present, with <30% tree understory present, tree recently seeded other comparable Recent cutover stratum (dbh >3 and stabilized, or conditions. (dense canopy cover. inches) present, with <30% tree non-maintained other comparable vegetation). understory condition. canopy cover wit maintained understory Low High Low High High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums descriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 100% 100% Right Bank Score > 1.2 CI= (Sum % RA * Scores*0.01)/2 100% 100% CI % Riparian Area> Rt Bank CI > 1.20 Left Bank Score > 1.2 Lt Bank CI > 1.20 1.20 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.60

RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF



Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** Martinsville Connector (VDOT) Henry R3 03010103 3/1/2019 Ν N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map SA, JB **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. 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Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.2 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.20 Left Bank Lt Bank CI > 1.20 1.20 1.2 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. populations. than 10% of the reach. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

Stream Impact Assessment Form Page 2										
Project #	Project Name (Applicant)		Locality	y Cowardin HUC Class.	Date	SAR # / Data Point	Impact / SAR length	Impact Factor		
0.00	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/1/2019	N	0	N/A	
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock										
livestock		3-7 -17			trangmenting of one	arrier, criarrienza			rictions,	
livestock	Negligible			al Category	erate			NOTES>>	rictions,	

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

CI

1.50

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2) COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

SCORE



DESCRIBE	PROPOSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** Martinsville Connector (VDOT) Henry R3 03010103 3/1/2019 0 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map SA, JB **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. 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0.9

0.5

High

Score

1.5

	Stream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (Applicant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
0.00	Martinsville Connector (VDOT)	Henry	R3	03010103	3/1/2019	0	0	N/A
4. CHANNEL	_ ALTERATION: Stream crossings, riprap, conc	rete, gabions, or o	concrete blocks, s	traightening of ch	annel, channeliza	ition, embankmer	nts, spoil piles, const	rictions,

			Condition	al Category		_	NOTES>>
	Negligible	Mir	nor	Mod	erate	Severe	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	is disrupted by any of the channel alterations listed in the parameter guidelines. If	of the channel alterations listed in	Greater than 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks shored with gabion, riprap, or cement.	
SCORE	1.5	1.3	1.1	0.9	0.7	0.5	

CI 1.50

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

0.96

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** Martinsville Connector (VDOT) Henry R3 02070010 3/02/2019 P N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map SA, JB **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 1.60 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.2 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.20 Left Bank Lt Bank CI > 1.20 1.20 1.2 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. populations. than 10% of the reach. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	Stream Ir	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (Applicant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
0.00	Martinsville Connector (VDOT)	Henry	R3	02070010	3/02/2019	Р	0	N/A
4. CHANNEL livestock	_ ALTERATION: Stream crossings, riprap, cond	rete, gabions, or o	concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,
		Condition	al Category				NOTES>>	

			Condition	al Category		
	Negligible	Mi	nor		erate	Severe
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is	is disrupted by any	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	
SCORE	1.5	1.3	1.1	0.9	0.7	0.5

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

CI 1.50

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



DESCRIBE PROPOSED IMPACT:

Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC Date SAR# **Factor** Class length **Martinsville Connector (VDOT)** Henry 03010103 3/28/19 Q N/A R6 Name(s) of Evaluator(s) Stream Name and Information Stream Map Unnamed Tributary to Marrowbone Creek 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Marginal Suboptimal Poor Low Marginal: Non-maintained High Poor: ow Suboptimal High Suboptima Riparian areas Lawns, mowed Riparian areas High Marginal: dense herbaceou and maintained Low Poor: with tree stratum (dbh > 3 inches) vegetation, riparian areas with tree stratum (dbh > 3 inches) areas, nurseries Impervious ense herbaceou no-till cropland; surfaces, mine present, with vegetation with lacking shrub and Tree stratum (dbh > 3 inches) present resent, with 30% actively grazed spoil lands. either a shrub layer or a tree layer (dbh > 3 30% tree canop cover and a tree stratum, hay production, ponds Riparian with > 60% tree canopy cover and an non-maintained understory. Wetlands to 60% tree anopy cover an pasture, sparsely vegetated nonenuded surface **Buffers** row crops, active maintained open water. If containing both herbaceous and shrub layers or a areas maintained area feed lots, trails, or inches) present, with <30% tree understory present, tree recently seeded other comparable Recent cutover stratum (dbh >3 and stabilized, or conditions. (dense canopy cover. inches) present, with <30% tree non-maintained other comparable vegetation). understory condition. canopy cover wit maintained understory Low Low High High High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums descriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 100% 100% Right Bank Score > 1.2 CI= (Sum % RA * Scores*0.01)/2 100% CI % Riparian Area> 100% Rt Bank CI > 1.20 Left Bank Score > 1.2 Lt Bank CI > 1.20 1.20 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.60

RCI= (Riparian CI)/2
COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

N/A



Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** Martinsville Connector (VDOT) Henry R3 02070010 3/02/2019 R N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map SA, JB **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. 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INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. populations. than 10% of the reach. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
0.00	Martinsville Connecto	or (VDOT)	Henry	R3	02070010	3/02/2019	R	0	N/A
4 CHANNEI	ALTERATION: Change areas			anneste blanke e				to	ations.
4. CHANNEL livestock	_ ALTERATION: Stream cross		Condition	al Category				ts, spoil piles, constr	ictions,
	ALTERATION: Stream cross Negligible			al Category Mod	traightening of characte				ictions,

tream has beer

channelized, normal stable

stream meander

pattern has not

stream has beer

channelized, normal stable

stream meander

pattern has not

0.7

recovere

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

the stream reach is disrupted by any of the channel

Iterations listed i

the parameter guidelines.

1.3

alterations listed in the parameter guidelines.

1.1

THE REACH CONDITION INDEX (RCI) >> 1.12

CI

1.50

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2) COMPENSATION REQUIREMENT (CR) >>

Greater than 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR

80% of banks shored with gabion, riprap, or cement.

0.5

N/A CR = RCI X LF X IF

INSERT PHOTOS:

SCORE

unaltered pattern or has naturalized.

1.5



Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC Class **Data Point** Length **Factor** Martinsville Connector (VDOT) Henry R3 02070010 3/02/2019 s N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map SA, JB **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. 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RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. 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INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
0.00	Martinsville Connecto	or (VDOT)	Henry	R3	02070010	3/02/2019	s	0	N/A
4. CHANNEI livestock	L ALTERATION: Stream cross	sings, riprap, conc		concrete blocks, s	traightening of ch	annel, channeliza		nts, spoil piles, constr	rictions,
	Negligible	Mi	nor		erate	Sev	/ere	NOTES	
Channel Alteration	Channelization, dredging, alteration,	Less than 20% of the stream reach is disrupted by any	20-40% of the stream reach is disrupted by any	of the channel	is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the channing the parameter of	of reach is disrupted nel alterations listed		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

1.50

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

0.5

INSERT PHOTOS:

SCORE



Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** Martinsville Connector (VDOT) Henry R3 02070010 3/02/2019 U N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map SA, JB **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. 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0.9

0.5

High

Score

1.5

	St	ream Ir	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
0.00	Martinsville Connecto	or (VDOT)	Henry	R3	02070010	3/02/2019	U	0	N/A
4. CHANNE livestock	L ALTERATION: Stream cross	ings, riprap, conc		concrete blocks, s	traightening of ch	annel, channeliza	ition, embankmer	NOTES>>	rictions,
	Negligible	Mi	nor		erate	Sev	vere	11012022	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is disrupted by any of the channel alterations listed in	guidelines. If	of the channel alterations listed in	Greater than 80% of by any of the change	nei aiterations listed juidelines AND/OR		

stream meander pattern has not

stream meander pattern has not

0.7

0.5

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

1.3

1.1

1.5

THE REACH CONDITION INDEX (RCI) >> 0.96

CI

1.50

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2) COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

N/A

INSERT PHOTOS:

SCORE



Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** Martinsville Connector (VDOT) Henry R3 02070010 3/02/2019 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map SA, JB **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 1.60 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 10% 90% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank 0.75 Lt Bank CI > 0.83 1.16 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
0.00	Martinsville Connecto	or (VDOT)	Henry	R3	02070010	3/02/2019	V	0	N/A
L CHANNEI									
vestock	ALILIATION. Stream cross.	ings, riprap, conci		al Category	traightening of ch	annel, channeliza		NOTES>>	rictions,
	Negligible Negligible			al Category	erate			NOTES>>	rictions,

stream meander pattern has not

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

stream meander pattern has not

1.1

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

1.5

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

CI

1.50

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

0.5

INSERT PHOTOS:

SCORE



Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC Date SAR# Class length **Factor Martinsville Connector (VDOT)** Henry R6 03010103 3/28/19 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map Unnamed Tributary to Marrowbone Creek 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Marginal Suboptimal Poor Low Marginal: Non-maintained High Poor: ow Suboptimal ligh Suboptima Riparian areas Lawns, mowed Riparian areas High Marginal: dense herbaceou and maintained Low Poor: with tree stratum (dbh > 3 inches) vegetation, riparian areas with tree stratum (dbh > 3 inches) areas, nurseries Impervious ense herbaceou no-till cropland; surfaces, mine present, with vegetation with lacking shrub and Tree stratum (dbh > 3 inches) present resent, with 30% actively grazed spoil lands. either a shrub layer or a tree layer (dbh > 3 30% tree canop cover and a tree stratum, hay production, ponds Riparian with > 60% tree canopy cover and an non-maintained understory. Wetlands to 60% tree anopy cover an pasture, sparsely vegetated nonenuded surface **Buffers** row crops, active maintained open water. If containing both herbaceous and shrub layers or a maintained area feed lots, trails, or inches) present, with <30% tree understory present, tree recently seeded other comparable Recent cutover stratum (dbh >3 and stabilized, or conditions. (dense canopy cover. inches) present, with <30% tree non-maintained other comparable vegetation). understory condition. canopy cover wit maintained understory Low High Low High High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums descriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 100% 100% Right Bank Score > 1.2 CI= (Sum % RA * Scores*0.01)/2 100% CI % Riparian Area> Rt Bank CI > 1.20 Left Bank Score > 1.2 Lt Bank CI > 1.20 1.20 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.60

COMPENSATION REQUIREMENT (CR) >>

RCI= (Riparian CI)/2

N/A

CR = RCI X LF X IF



Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** Martinsville Connector (VDOT) Henry R3 03010103 2/27/2019 Υ N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map SA, JB **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow egetative protection present on less developed wide bankfull benches be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. likely has access to bankfull benches,or newly developed transient, contribute instability. Deposition that contribute to stability may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sedimen portions of the reach. Transient than 80% of stream bed is covered by diment covers 10-40% of the stream bottom. deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 2.00 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.2 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 100% 100% Rt Bank CI > CI 1.20 Left Bank 1.5 Lt Bank CI > 1.50 1.35 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. **Stream Gradient** CI

Scores

1.5

0.9

0.5

High

1.50

Stream Impact Assessment Form Page 2									
Project #	Project Name (Applicant)		Locality	Locality Cowardin Class. HUC		Date	SAR # / Data Point	Impact / SAR length	Impact Factor
0.00	Martinsville Connector (VDOT)		Henry	R3	03010103	2/27/2019	Υ	0	N/A
I. CHANNEI vestock	L ALTERATION: Stream cross	sings, riprap, concr			traightening of cha	annel, channeliza	tion, embankmer	nts, spoil piles, consti	rictions,
	Negligible	Conditional Category or Moderate			Severe		NO E3>>		
			nor			Sev	/ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is	40 - 60% of reach is disrupted by any of the channel	is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chann	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.23 RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L_I X IF

INSERT PHOTOS:



Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** Martinsville Connector (VDOT) Henry R3 03010103 2/27/2019 Z N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map SA, JB **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully developed wide bankfull benches Depositional features contribute to stability. The bankfull and low flow egetative protection present on less be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. likely has access to bankfull benches,or newly developed transient, contribute instability. Deposition that contribute to stability may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sedimen portions of the reach. Transient than 80% of stream bed is covered by diment covers 10-40% of the stream bottom. deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 2.40 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. 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Cover populations. populations. than 10% of the reach. **Stream Gradient** CI

Scores

1.5

0.9

0.5

High

1.50

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	roject # Project Name (Applicant) 0.00 Martinsville Connector (VDOT)		Locality	Cowardin Class.	HUC	Date	SAR # / Data Point Z	Impact / SAR length	Impact Factor N/A
0.00			Henry	R3	03010103	2/27/2019			
CHANNE	ALTERATION -								
	L ALTERATION: Stream cross	ings, riprap, conci		al Category	traightening of ch	annel, channeliza			ictions,
vestock	Negligible							NOTES>>	ctions,

0.5 1.3 1.1 0.9 0.7 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

Iterations listed in the parameter guidelines. If

tream has beer

channelized, normal stable

stream meander

pattern has not

Iterations listed in the parameter guidelines. If

stream has beer

channelized, normal stable

stream meander

pattern has not

recovere

Greater than 80% of reach is disrupted by any of the channel alterations lister in the parameter guidelines AND/OR

80% of banks shored with gabion, riprap, or cement.

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

Less than 20% of

the stream reach s disrupted by any

of the channel

Iterations listed i

the parameter guidelines.

20-40% of the

stream reach is disrupted by any

of the channel

alterations listed in the parameter guidelines.

THE REACH CONDITION INDEX (RCI) >> 1.28 RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

CI

1.30

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X L_I X IF

INSERT PHOTOS:

Channel

Alteration

Scores

Channelization, dredging, alteration, or hardening absent. Stream has an

unaltered pattern or has naturalized.

1.5



DESCRIBE PROPOSED IMPAC	T:	
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** Martinsville Connector (VDOT) R4 03010103 2/27/2019 AB N/A Henry Name(s) of Evaluator(s) Stream Name and Information Stream Map SA, JB AΒ 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. 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(rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. 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INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. **Stream Gradient** CI

Scores

1.5

0.9

0.5

High

1.50

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	# Project Name (Applicant) Martinsville Connector (VDOT)		Locality Henry	Cowardin Class. R4	HUC 03010103	Date 2/27/2019	SAR # / Data Point AB	Impact / SAR length	Impact Factor N/A
0.00								0	
	ALLERATION: Stream cross	ings ringan conci	rete nahions or c	concrete blocks st	traightening of ch	annel channeliza	tion embankmer	its shoil niles consti	rictions
ivestock	_ ALTERATION: Stream cross	ings, riprap, conci		al Category	traightening of ch	annel, channeliza	ition, embankmer	NOTES>>	rictions,
	Negligible			al Category	erate		tion, embankmer		rictions,

stream meander pattern has not

0.7

0.5

0.9 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

stream meander pattern has not

1.1

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

1.20

CI

1.30

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L_I X IF

INSERT PHOTOS:

Scores



DESCRIBE PROPOSED IMPAC	T:	
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** Martinsville Connector (VDOT) Henry R3 02070010 3/01/2019 AC N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map SA, JB **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. 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INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

Stream Impact Assessment Form Page 2									
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
0.00	Martinsville Connector (VDOT) Henry			R3	02070010	3/01/2019	AC	0	N/A
4. CHANNE livestock	L ALTERATION: Stream cross	ings, riprap, concr			traightening of ch	annel, channeliza	tion, embankmer		rictions,
	Negligible	Mir		al Category				NOTES>>	
				Mod	erate	Sev	ere		
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	40 - 60% of reach is disrupted by any of the channel	erate 6U - 8U% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% of by any of the chann	nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2) COMPENSATION REQUIREMENT (CR) >>

N/A CR = RCI X LF X IF

INSERT PHOTOS:



DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** Martinsville Connector (VDOT) Henry R4 03010103 2/27/2018 AD N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map SA, JB **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 95% 5% 100% Right Bank Score > 0.6 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > 0.65 CI % Riparian Area> Left Bank Lt Bank CI > 1.50 1.07 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

Stream Impact Assessment Form Page 2										
Project #	Project Name (App	licant)	Locality	Cowardin Class.	нис	Date	SAR # / Data Point	Impact / SAR length	Impact Factor	
0.00	Martinsville Connector (VDOT)		Henry	R4	03010103	2/27/2018	AD	0	N/A	
I. CHANNE vestock	L ALTERATION: Stream cross	ings, riprap, concr			traightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, constr	ictions,	
	No of other		Conditions	al Category				INCHES		
	Negliable	Mir	nor	Mod	erate	Sev	vere	140120		
Channel Alteration	Negligible Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	40 - 60% of reach is disrupted by any of the channel	60 - 80% of reach	Greater than 80% of by any of the chant	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

COMPENSATION REQUIREMENT (CR) >> N/A CR = RCI X LF X IF

INSERT PHOTOS:



Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC Date SAR# Class length **Factor Martinsville Connector (VDOT)** Henry R6 03010103 3/28/19 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map Unnamed Tributary to Marrowbone Creek 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Marginal Suboptimal Poor Low Marginal: Non-maintained High Poor: ow Suboptimal High Suboptima Riparian areas Lawns, mowed Riparian areas High Marginal: dense herbaceou and maintained Low Poor: with tree stratum (dbh > 3 inches) vegetation, riparian areas with tree stratum (dbh > 3 inches) areas, nurseries Impervious ense herbaceou no-till cropland; surfaces, mine present, with vegetation with lacking shrub and Tree stratum (dbh > 3 inches) present resent, with 30% actively grazed spoil lands. either a shrub layer or a tree layer (dbh > 3 30% tree canop cover and a tree stratum, hay production, ponds Riparian with > 60% tree canopy cover and an non-maintained understory. Wetlands to 60% tree anopy cover an pasture, sparsely vegetated nonenuded surface **Buffers** row crops, active maintained open water. If containing both herbaceous and shrub layers or a areas maintained area feed lots, trails, or inches) present, with <30% tree understory present, tree recently seeded other comparable Recent cutover stratum (dbh >3 and stabilized, or conditions. (dense canopy cover. inches) present, with <30% tree non-maintained other comparable vegetation). understory condition. canopy cover wit maintained understory Low High Low High High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums descriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 100% 100% Right Bank Score > 1.2 CI= (Sum % RA * Scores*0.01)/2 100% CI % Riparian Area> 100% Rt Bank CI > 1.20 Left Bank Score > 1.2 Lt Bank CI > 1.20 1.20 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.60

RCI= (Riparian CI)/2
COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

N/A



Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** Martinsville Connector (VDOT) Henry R3 02070010 3/01/2019 AF N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map SA, JB **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 3.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. 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INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.50

High

Score

1.5

Stream Impact Assessment Form Page 2															
Project #	Project Name (Applicant)		Locality	Cowardin Class.	нис	Date	SAR # / Data Point	Impact / SAR length	Impact Factor						
0.00	Martinsville Connector (VDOT) Henry			R3	02070010	3/01/2019	AF	0	N/A						
	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	straightening of ch	4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock									
	Negligible	Miı	nor		erate	Sev	ere	NOTES>>							
Channel Alteration	Negligible Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mod 40 - 60% of reach is disrupted by any of the channel		Greater than 80% of by any of the chann	f reach is disrupted let alterations listed uidelines AND/OR ored with gabion,								

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



DESCRIBE	PROPOSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** Martinsville Connector (VDOT) Henry R3 02070010 3/01/2019 ΑI N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map SA, JB **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. 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INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

Stream Impact Assessment Form Page 2										
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor	
0.00	Martinsville Connecto	Henry	R3	02070010	3/01/2019	Al	0	N/A		
4. CHANNEI ivestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of ch	annel, channeliza	ition, embankmer	nts, spoil piles, const	rictions,	
	Negligible	Mir						INO I E3>>		
			1101	Moa	erate	Sev	/ere			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chang in the parameter of	of reach is disrupted nel alterations listed juidelines AND/OR ored with gabion,			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC Date SAR# Class length **Factor Martinsville Connector (VDOT)** Henry R6 03010103 3/28/19 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map Unnamed Tributary to Marrowbone Creek 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Marginal Suboptimal Poor Low Marginal: Non-maintained High Poor: ow Suboptimal High Suboptima Riparian areas Lawns, mowed Riparian areas High Marginal: lense herbaceou and maintained Low Poor: with tree stratum (dbh > 3 inches) vegetation, riparian areas with tree stratum (dbh > 3 inches) areas, nurseries Impervious ense herbaceou no-till cropland; surfaces, mine present, with vegetation with lacking shrub and Tree stratum (dbh > 3 inches) present resent, with 30% actively grazed spoil lands. either a shrub layer or a tree layer (dbh > 3 30% tree canop cover and a tree stratum, hay production, ponds Riparian with > 60% tree canopy cover and an non-maintained understory. Wetlands to 60% tree anopy cover an pasture, sparsely vegetated nonenuded surface **Buffers** row crops, active maintained open water. If containing both herbaceous and shrub layers or a maintained area feed lots, trails, or inches) present, with <30% tree understory present, tree recently seeded other comparable Recent cutover stratum (dbh >3 and stabilized, or conditions. (dense canopy cover. inches) present, with <30% tree non-maintained other comparable vegetation). understory condition. canopy cover wit maintained understory Low High Low High High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums descriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 100% 100% Right Bank Score > 1.2 CI= (Sum % RA * Scores*0.01)/2 100% CI % Riparian Area> 100% Rt Bank CI > 1.20 Left Bank Score > 1.2 Lt Bank CI > 1.20 1.20 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.60

RCI= (Riparian CI)/2
COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

N/A



Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC Date SAR# Class length **Factor Martinsville Connector (VDOT)** Henry R6 03010103 3/28/19 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map Unnamed Tributary to Marrowbone Creek 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Marginal Suboptimal Poor Low Marginal: Non-maintained High Poor: ow Suboptimal High Suboptima Riparian areas Lawns, mowed Riparian areas High Marginal: dense herbaceou and maintained Low Poor: with tree stratum (dbh > 3 inches) vegetation, riparian areas with tree stratum (dbh > 3 inches) areas, nurseries Impervious ense herbaceou no-till cropland; surfaces, mine present, with vegetation with lacking shrub and Tree stratum (dbh > 3 inches) present resent, with 30% actively grazed spoil lands. either a shrub layer or a tree layer (dbh > 3 30% tree canop cover and a tree stratum, hay production, ponds Riparian with > 60% tree canopy cover and an non-maintained understory. Wetlands to 60% tree anopy cover an pasture, sparsely vegetated nonenuded surface **Buffers** row crops, active maintained open water. If containing both herbaceous and shrub layers or a areas maintained area feed lots, trails, or inches) present, with <30% tree understory present, tree recently seeded other comparable Recent cutover stratum (dbh >3 and stabilized, or conditions. (dense canopy cover. inches) present, with <30% tree non-maintained other comparable vegetation). understory condition. canopy cover wit maintained understory Low High Low High High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums descriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 100% 100% Right Bank Score > 1.2 CI= (Sum % RA * Scores*0.01)/2 100% CI % Riparian Area> 100% Rt Bank CI > 1.20 Left Bank Score > 1.2 Lt Bank CI > 1.20 1.20 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.60

RCI= (Riparian CI)/2
COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

N/A



Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC Date SAR# Class length **Factor** Martinsville Connector (VDOT) Henry R6 03010103 3/28/19 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map Unnamed Tributary to Marrowbone Creek 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Marginal Suboptimal Poor Low Marginal: Non-maintained High Poor: ow Suboptimal ligh Suboptima Riparian areas awns, mowed Riparian areas High Marginal: lense herbaceou and maintained Low Poor: with tree stratum (dbh > 3 inches) vegetation, riparian areas with tree stratum (dbh > 3 inches) areas, nurseries Impervious ense herbaceou no-till cropland; surfaces, mine present, with vegetation with lacking shrub and Tree stratum (dbh > 3 inches) present resent, with 30% actively grazed spoil lands. either a shrub layer or a tree layer (dbh > 3 30% tree canop cover and a tree stratum, hay production, ponds Riparian with > 60% tree canopy cover and an non-maintained understory. Wetlands to 60% tree anopy cover an pasture, sparsely vegetated nonenuded surface **Buffers** row crops, active maintained open water. If containing both herbaceous and shrub layers or a maintained area feed lots, trails, or inches) present, with <30% tree understory present tree recently seeded other comparable Recent cutover stratum (dbh >3 and stabilized, or conditions. (dense canopy cover. inches) present, with <30% tree non-maintained other comparable vegetation). understory condition. canopy cover wit maintained understory High High High Low Low Low Condition 0.75 1.5 1.2 1.1 0.85 0.6 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums descriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 100% 100% Right Bank Score > 1.2 CI= (Sum % RA * Scores*0.01)/2 100% 100% CI % Riparian Area> Rt Bank CI > 1.20 Left Bank 1.2 Lt Bank CI > 1.20 1.20 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.60

RCI= (Riparian CI)/2 COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF



Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** Martinsville Connector (VDOT) Henry R3 03010103 2/27/2019 AN N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map SA, JB **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow egetative protection present on less developed wide bankfull benches be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. likely has access to bankfull benches,or newly developed transient, contribute instability. Deposition that contribute to stability may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sedimen portions of the reach. Transient than 80% of stream bed is covered by diment covers 10-40% of the stream bottom. deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 1.60 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 100% 100% Rt Bank CI > CI 1.50 Left Bank 1.5 Lt Bank CI > 1.50 1 50 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. Stream Gradient CI

Scores

1.5

0.9

0.5

High

0.50

Stream Impact Assessment Form Page 2										
Project #	Project Name (Applicant) Locality Cowardin Class. HUC Date					SAR # / Data Point	Impact / SAR length	Impact Factor		
0.00	Martinsville Connecto	Henry	R3	03010103	2/27/2019	AN	0	N/A		
I. CHANNEI vestock	L ALTERATION: Stream cross	sings, riprap, conc		concrete blocks, s	traightening of cha	annel, channeliza	tion, embankmer	nts, spoil piles, consti	rictions,	
	Negligible			ar category				INO 1 E9>>		
	regugible	Mi	nor		erate	Sev	/ere			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is	40 - 60% of reach is disrupted by any of the channel	is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chann	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.02 RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L_I X IF

INSERT PHOTOS:



DESCRIBE PROPOSED IMPA	ACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** Martinsville Connector (VDOT) Henry R3 02070010 3/01/2019 AO N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map SA, JB **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. populations. than 10% of the reach. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
0.00	Martinsville Connector (VDOT) Henr			R3	02070010	3/01/2019	AO	0	N/A
4. CHANNE livestock	L ALTERATION: Stream cross	ings, riprap, conci		concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, consti	rictions,
	Negligible							14012000	
	Negligible	IVIII	nor	Mod	erate	Sev	ere		
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	40 - 60% of reach is disrupted by any of the channel	erate 50 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% of by any of the chang in the parameter of	f reach is disrupted lel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



DESCRIBE	PROPOSED	IMPACT:
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Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC Date SAR# Class length **Factor Martinsville Connector (VDOT)** Henry R6 03010103 3/28/19 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map Unnamed Tributary to Marrowbone Creek 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Marginal Suboptimal Poor Low Marginal: Non-maintained High Poor: ow Suboptimal ligh Suboptima Riparian areas Lawns, mowed Riparian areas High Marginal: lense herbaceou and maintained Low Poor: with tree stratum (dbh > 3 inches) vegetation, riparian areas with tree stratum (dbh > 3 inches) areas, nurseries Impervious ense herbaceou no-till cropland; surfaces, mine present, with vegetation with lacking shrub and Tree stratum (dbh > 3 inches) present resent, with 30% actively grazed spoil lands. either a shrub layer or a tree layer (dbh > 3 30% tree canop cover and a tree stratum, hay production, ponds Riparian with > 60% tree canopy cover and an non-maintained understory. Wetlands to 60% tree anopy cover an pasture, sparsely vegetated nonenuded surface **Buffers** row crops, active maintained open water. If containing both herbaceous and shrub layers or a maintained area feed lots, trails, or inches) present, with <30% tree understory present, tree recently seeded other comparable Recent cutover stratum (dbh >3 and stabilized, or conditions. (dense canopy cover. inches) present, with <30% tree non-maintained other comparable vegetation). understory condition. canopy cover wit maintained understory Low High High Low High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums descriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 100% 100% Right Bank Score > 1.2 CI= (Sum % RA * Scores*0.01)/2 100% CI % Riparian Area> Rt Bank CI > 1.20 Left Bank Score > 1.2 Lt Bank CI > 1.20 1.20 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.60

COMPENSATION REQUIREMENT (CR) >>

N/A

RCI= (Riparian CI)/2

CR = RCI X LF X IF



Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** Martinsville Connector (VDOT) Henry R4 02070010 3/01/2019 AR N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map SA, JB **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. 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0.9

0.5

High

Score

1.5

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



DESCRIBE	PROPOSED	IMPACT:
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Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC Date SAR# **Factor** Class length **Martinsville Connector (VDOT)** Henry R6 03010103 3/28/19 ΑU N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map Unnamed Tributary to Marrowbone Creek 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Marginal Suboptimal Poor Low Marginal: Non-maintained High Poor: ow Suboptimal ligh Suboptima Riparian areas Lawns, mowed Riparian areas High Marginal: dense herbaceou and maintained Low Poor: with tree stratum (dbh > 3 inches) vegetation, riparian areas with tree stratum (dbh > 3 inches) areas, nurseries Impervious ense herbaceou no-till cropland; surfaces, mine present, with vegetation with lacking shrub and Tree stratum (dbh > 3 inches) present resent, with 30% actively grazed spoil lands. either a shrub layer or a tree layer (dbh > 3 30% tree canop cover and a tree stratum, hay production, ponds Riparian with > 60% tree canopy cover and an non-maintained understory. Wetlands to 60% tree anopy cover an pasture, sparsely vegetated nonenuded surface **Buffers** row crops, active maintained open water. If containing both herbaceous and shrub layers or a areas maintained area feed lots, trails, or inches) present, with <30% tree understory present, tree recently seeded other comparable Recent cutover stratum (dbh >3 and stabilized, or conditions. (dense canopy cover. inches) present, with <30% tree non-maintained other comparable vegetation). understory condition. canopy cover wit maintained understory Low Low High High High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums descriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 100% 100% Right Bank Score > 1.2 CI= (Sum % RA * Scores*0.01)/2 100% CI % Riparian Area> Rt Bank CI > 1.20 Left Bank Score > 1.2 Lt Bank CI > 1.20 1.20 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.60

RCI= (Riparian CI)/2
COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

N/A



Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** Martinsville Connector (VDOT) Henry R3 02070010 3/01/2019 AW N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map SA, JB **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Area shows Optimal Suboptimal Marginal Poor signs of recent clearcut. Low Marginal Very young vegetation. High Poor: ow Suboptimal Non-maintained Stands of 2-6 inch pine High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, and poplar within vicinity. with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. 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Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

0.50

High

Score

1.5

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	olicant)	Locality	Cowardin Class.	нис	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
0.00	Martinsville Connecto	or (VDOT)	Henry	R3	02070010	3/01/2019	AW	0	N/A
4. CHANNE livestock	L ALTERATION: Stream cross	sings, riprap, concr		concrete blocks, s	straightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, consti	rictions,
	Negligible	Mir				C		NO ILS	
			101	IVIOG	erate	Sev	rere		
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel	Greater than 80% of by any of the chant	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,	I	

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

N/A

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

INSERT PHOTOS:



DESCRIBE	PROPOSED	IMPACT:

Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC Date SAR# **Factor** Class length **Martinsville Connector (VDOT)** Henry 03010103 3/28/19 N/A R6 Name(s) of Evaluator(s) Stream Name and Information Stream Map Unnamed Tributary to Marrowbone Creek 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Marginal Suboptimal Poor Low Marginal: Non-maintained High Poor: ow Suboptimal High Suboptima Riparian areas Lawns, mowed Riparian areas High Marginal: dense herbaceou and maintained Low Poor: with tree stratum (dbh > 3 inches) vegetation, riparian areas with tree stratum (dbh > 3 inches) areas, nurseries Impervious ense herbaceou no-till cropland; surfaces, mine present, with vegetation with lacking shrub and Tree stratum (dbh > 3 inches) present resent, with 30% actively grazed spoil lands. either a shrub layer or a tree layer (dbh > 3 30% tree canop cover and a tree stratum, hay production, ponds Riparian with > 60% tree canopy cover and an non-maintained understory. Wetlands to 60% tree anopy cover an pasture, sparsely vegetated nonenuded surface **Buffers** row crops, active maintained open water. If containing both herbaceous and shrub layers or a maintained area feed lots, trails, or inches) present, with <30% tree understory present, tree recently seeded other comparable Recent cutover stratum (dbh >3 and stabilized, or conditions. (dense canopy cover. inches) present, with <30% tree non-maintained other comparable vegetation). understory condition. canopy cover wit maintained understory Low Low High High High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums descriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 100% 100% Right Bank Score > 1.2 CI= (Sum % RA * Scores*0.01)/2 100% CI % Riparian Area> 100% Rt Bank CI > 1.20 Left Bank Score > 1.2 Lt Bank CI > 1.20 1.20 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.60

RCI= (Riparian CI)/2
COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

N/A



Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** Martinsville Connector (VDOT) Henry R3 02070010 3/04/2019 BA N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map SA, JB **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. 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0.9

0.5

0.90

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
0.00	Martinsville Connecto	or (VDOT)	Henry	R3	02070010	3/04/2019	ВА	0	N/A
I. CHANNEL vestock	_ ALTERATION: Stream cross	ings, riprap, conci	rete, gabions, or o	concrete blocks, s	traightening of cha	annel, channeliza	tion, embankmen	nts, spoil piles, const	rictions,
			Conditions	al Category				NOTES	
	Negligible	Mir	Conditiona nor	al Category	erate	Sev	rere	NOTES>>	
Channel Alteration	Negligible Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mod 40 - 60% of reach is disrupted by any of the channel	60 - 80% of reach is disrupted by any of the channel alterations listed in		f reach is disrupted tel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



DESCRIBE	PROPOSED	IMPACT:
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Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC Date SAR# Class length **Factor Martinsville Connector (VDOT)** Henry 03010103 3/28/19 вв N/A R6 Name(s) of Evaluator(s) Stream Name and Information Stream Map Unnamed Tributary to Marrowbone Creek 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Marginal Suboptimal Poor Low Marginal: Non-maintained High Poor: ow Suboptimal High Suboptima Riparian areas Lawns, mowed Riparian areas High Marginal: dense herbaceou and maintained Low Poor: with tree stratum (dbh > 3 inches) vegetation, riparian areas with tree stratum (dbh > 3 inches) areas, nurseries Impervious ense herbaceou no-till cropland; surfaces, mine present, with vegetation with lacking shrub and Tree stratum (dbh > 3 inches) present resent, with 30% actively grazed spoil lands. either a shrub layer or a tree layer (dbh > 3 30% tree canop cover and a tree stratum, hay production, ponds Riparian with > 60% tree canopy cover and an non-maintained understory. Wetlands to 60% tree anopy cover an pasture, sparsely vegetated nonenuded surface **Buffers** row crops, active maintained open water. If containing both herbaceous and shrub layers or a areas maintained area feed lots, trails, or inches) present, with <30% tree understory present, tree recently seeded other comparable Recent cutover stratum (dbh >3 and stabilized, or conditions. (dense canopy cover. inches) present, with <30% tree non-maintained other comparable vegetation). understory condition. canopy cover wit maintained understory Low Low High High High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums descriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 100% 100% Right Bank Score > 1.2 CI= (Sum % RA * Scores*0.01)/2 100% CI % Riparian Area> 100% Rt Bank CI > 1.20 Left Bank Score > 1.2 Lt Bank CI > 1.20 1.20 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.60

RCI= (Riparian CI)/2
COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

N/A



Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC Date SAR# Class length **Factor Martinsville Connector (VDOT)** Henry R6 03010103 3/28/19 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map Unnamed Tributary to Marrowbone Creek 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Marginal Suboptimal Poor Low Marginal: Non-maintained High Poor: ow Suboptimal ligh Suboptima Riparian areas Lawns, mowed Riparian areas High Marginal: dense herbaceou and maintained Low Poor: with tree stratum (dbh > 3 inches) vegetation, riparian areas with tree stratum (dbh > 3 inches) areas, nurseries Impervious ense herbaceou no-till cropland; surfaces, mine present, with vegetation with lacking shrub and Tree stratum (dbh > 3 inches) present resent, with 30% actively grazed spoil lands. either a shrub layer or a tree layer (dbh > 3 30% tree canop cover and a tree stratum, hay production, ponds Riparian with > 60% tree canopy cover and an non-maintained understory. Wetlands to 60% tree anopy cover an pasture, sparsely vegetated nonenuded surface **Buffers** row crops, active maintained open water. If containing both herbaceous and shrub layers or a areas maintained area feed lots, trails, or inches) present, with <30% tree understory present, tree recently seeded other comparable Recent cutover stratum (dbh >3 and stabilized, or conditions. (dense canopy cover. inches) present, with <30% tree non-maintained other comparable vegetation). understory condition. canopy cover wit maintained understory Low Low High High High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums descriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 100% 100% Right Bank Score > 1.2 CI= (Sum % RA * Scores*0.01)/2 100% CI % Riparian Area> 100% Rt Bank CI > 1.20 Left Bank Score > 1.2 Lt Bank CI > 1.20 1.20 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.60 RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

N/A



Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** Martinsville Connector (VDOT) Henry R3 02070010 3/04/2019 BG N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map SA, JB **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. 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0.9

0.5

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
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	L ALTERATION: Stream cross	ings, riprap, conci	rete, gabions, or o	concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmen	its, spoil piles, consti	rictions.
ivestock			Conditiona	al Category					· · · · · · · · ·
IVESTOCK	Negligible	Min	Conditiona	al Category	erate			NOTES>>	

stream meander pattern has not

stream meander pattern has not

0.7

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

1.3

1.1

1.5

THE REACH CONDITION INDEX (RCI) >>

CI

1.50

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

0.5

INSERT PHOTOS:

SCORE



DESCRIBE PROPOSED IMPACT:	DE	SCR	BE I	PRO	POSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** Martinsville Connector (VDOT) Henry R3 02070010 3/04/2019 BH N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map SA, JB **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 70% 30% 100% Right Bank Score > 1.5 1.1 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.38 Left Bank Lt Bank CI > 1.50 1.5 1.44 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
0.00	Martinsville Connecto	or (VDOT)	Henry	R3	02070010	3/04/2019	ВН	0	N/A
4. CHANNEI livestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of cha	annel, channeliza	ition, embankmer	nts, spoil piles, consti	rictions,
	Negligible	Mir			erate	Sev	/ere	NOTES>>	
				40 - 60% of reach				1	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	of the channel alterations listed in the parameter guidelines. If	is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	in the parameter g	nei aiterations listed juidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2) COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



DESCRIBE PROPOS	SED IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** Martinsville Connector (VDOT) Henry R4 02070010 3/04/2019 BJ N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map SA, JB **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 85% 15% 100% Right Bank Score > 1.5 1.1 CI= (Sum % RA * Scores*0.01)/2 95% 5% 100% Rt Bank CI > CI % Riparian Area> 1.44 Left Bank Lt Bank CI > 1.48 1.5 1.1 1.46 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.50

High

Score

1.5

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
0.00	Martinsville Connecto	or (VDOT)	Henry	R4	02070010	3/04/2019	BJ	0	N/A
4. CHANNE livestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of cha	annel, channeliza	tion, embankmer	nts, spoil piles, constr	ictions,
	Negligible	Mir	nor		erate	Sev	ere	NO I LO	
Channel Alteration	Negligible Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chann	f reach is disrupted let alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** Martinsville Connector (VDOT) Henry R3 02070010 3/04/2019 BM N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map SA, JB **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Area has been Optimal Suboptimal Marginal Poor recently logged. Area Low Marginal lacks vegetation for High Poor: ow Suboptimal Non-maintained stabilization. High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area eed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 50% 50% 100% Right Bank 0.85 Score > 0.6 CI= (Sum % RA * Scores*0.01)/2 60% 40% 100% Rt Bank CI > CI % Riparian Area> 0.73 Left Bank 0.85 Lt Bank CI > 0.70 0.71 0.6 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	нис	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
0.00	Martinsville Connecto	or (VDOT)	Henry	R3	02070010	3/04/2019	вм	0	N/A
4. CHANNEI	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of cha	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,
	Negligible			ar oategory				INUIESSS	
	Negligible	Mii	nor	Mod	erate	Sev	/ere		
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chang in the parameter g	of reach is disrupted	1	

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2) COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



DESCRIBE PRO	POSED IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** Martinsville Connector (VDOT) Henry R3 02070010 3/04/2019 BT N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map SA, JB **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 65% 35% 100% Right Bank 0.85 Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 15% 85% 100% Rt Bank CI > CI % Riparian Area> 1.27 Left Bank 0.85 Lt Bank CI > 0.95 1.11 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

Stream Impact Assessment Form Page 2									
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
0.00	Martinsville Connecto	or (VDOT)	Henry	R3	02070010	3/04/2019	ВТ	0	N/A
4. CHANNEL ivestock	_ ALTERATION: Stream cross	ings, riprap, concr	rete, gabions, or o		traightening of ch	annel, channeliza	tion, embankmer		ictions,
			Conditions	ai Calegory				INOTES>>	
	Negligible	Mir	nor		erate	Ser	/ere	NOTES>>	

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

1.58

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

0.5

INSERT PHOTOS:

SCORE



DESCRIBE PROPOS	SED IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** Martinsville Connector (VDOT) Henry R3 02070010 3/01/2019 BW N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map SA, JB **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Area has been Optimal Suboptimal Marginal Poor recently logged. Area Low Marginal lacks vegetation for High Poor: ow Suboptimal Non-maintained stabilization. High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area eed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 0.6 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 0.60 Left Bank Lt Bank CI > 0.60 0.60 0.6 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

Stream Impact Assessment Form Page 2									
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
0.00	Martinsville Connecto	or (VDOT)	Henry	R3	02070010	3/01/2019	BW	0	N/A
ivestock	L ALTERATION: Stream cross	ings, riprap, conci		al Category	traigntening of ch	armer, crianneliza	uon, embankmer	NOTES>>	ictions,
								NO I L3//	
	Negligible	Miı	nor	Mod	erate	Sev	/ere	NOTES	
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach	Greater than 80% of by any of the chanr in the parameter g	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



DESCRIBE	PROPOSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** Martinsville Connector (VDOT) Henry R3 02070010 3/04/2019 BX N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map SA, JB **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 1.60 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	нис	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
0.00	Martinsville Connecto	or (VDOT)	Henry	R3	02070010	3/04/2019	вх	0	N/A
4. CHANNEI ivestock	_ ALTERATION: Stream cross	ings, riprap, concr			traightening of ch	annel, channeliza	tion, embankmer	its, spoil piles, constr	rictions,
			Conditiona	al Category				NOTES>>	
	Negligible	Mir			erate	Sev	vere .	NOTES>>	

stream meander pattern has not

0.7

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

stream meander pattern has not

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

1.3

1.1

1.5

THE REACH CONDITION INDEX (RCI) >>

1.06

CI

1.30

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

0.5

INSERT PHOTOS:

SCORE



DESCRIBE	PROPOSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** Martinsville Connector (VDOT) Henry R3 02070010 3/04/2019 BZ N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map SA, JB **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 3.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Area has been Optimal Suboptimal Marginal Poor recently logged. Area Low Marginal lacks vegetation for High Poor: ow Suboptimal Non-maintained stabilization. High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area eed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 0.6 CI= (Sum % RA * Scores*0.01)/2 80% 20% 100% Rt Bank CI > 0.60 CI % Riparian Area> Left Bank Lt Bank CI > 0.72 0.66 0.6 1.2 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.50

High

Score

1.5

Stream Impact Assessment Form Page 2										
Project #	Project Name (App	licant)	Locality	Cowardin Class.	нис	Date	SAR # / Data Point	Impact / SAR length	Impact Factor	
0.00	Martinsville Connecto	or (VDOT)	Henry	R3	02070010	3/04/2019	BZ	0	N/A	
4. CHANNEI	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,	
	Negligible	Miı	nor	Mod	oroto	Cai				
						Sel	/ere			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	-	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% of by any of the chang in the parameter of	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2) COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



DESCRIBE PROPOSED IMPACT:	DE	SCR	BE I	PRO	POSED	IMPACT:
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Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC Date SAR# Class length **Factor Martinsville Connector (VDOT)** Henry 03010103 3/28/19 CI N/A R6 Name(s) of Evaluator(s) Stream Name and Information Stream Map Unnamed Tributary to Marrowbone Creek 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Marginal Suboptimal Poor Low Marginal: Non-maintained High Poor: ow Suboptimal ligh Suboptima Riparian areas Lawns, mowed Riparian areas High Marginal: lense herbaceou and maintained Low Poor: with tree stratum (dbh > 3 inches) vegetation, riparian areas with tree stratum (dbh > 3 inches) areas, nurseries Impervious ense herbaceou no-till cropland; surfaces, mine present, with vegetation with lacking shrub and Tree stratum (dbh > 3 inches) present resent, with 30% actively grazed spoil lands. either a shrub layer or a tree layer (dbh > 3 30% tree canop cover and a tree stratum, hay production, ponds Riparian with > 60% tree canopy cover and an non-maintained understory. Wetlands to 60% tree anopy cover an pasture, sparsely vegetated nonenuded surface **Buffers** row crops, active maintained open water. If containing both herbaceous and shrub layers or a maintained area feed lots, trails, or inches) present, with <30% tree understory present, tree recently seeded other comparable Recent cutover stratum (dbh >3 and stabilized, or conditions. (dense canopy cover. inches) present, with <30% tree non-maintained other comparable vegetation). understory condition. canopy cover wit maintained understory Low Low High High High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums descriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 100% 100% Right Bank Score > 1.2 CI= (Sum % RA * Scores*0.01)/2 100% CI % Riparian Area> 100% Rt Bank CI > 1.20 Left Bank Score > 1.2 Lt Bank CI > 1.20 1.20 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.60

RCI= (Riparian CI)/2
COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

N/A

INSERT PHOTOS:



Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** Martinsville Connector (VDOT) Henry R3 02070010 3/04/2019 CK N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map SA, JB **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. 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INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

Stream Impact Assessment Form Page 2									
Project #	TOTAL NATIONAL PRODUCTION OF LOCALITY I HOLD I DATE I TOTAL I							Impact Factor	
0.00	Martinsville Connecto	or (VDOT)	Henry	R3	02070010	3/04/2019	СК	0	N/A
4. CHANNEI ivestock	L ALTERATION: Stream cross	sings, riprap, conc		concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,
	Negligible	Mi	nor		erate	Sev	rere	NOTES	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is	is disrupted by any of the channel alterations listed in the parameter guidelines. If	180 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	by any of the chanr	nel alterations listed uidelines AND/OR ored with gabion,	I	
		1							

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



DESCRIBE PROPOS	SED IMPACT:
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Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC Date SAR# Class length **Factor Martinsville Connector (VDOT)** Henry R4 03010103 3/1/2019 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map Unnamed Tributary to Marrowbone Creek 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Marginal Suboptimal Poor Low Marginal: Non-maintained High Poor: ow Suboptimal High Suboptima Riparian areas awns, mowed Riparian areas High Marginal: lense herbaceo and maintained Low Poor: with tree stratum (dbh > 3 inches) vegetation, riparian areas with tree stratum (dbh > 3 inches) Impervious surfaces, mine areas, nurseries ense herbaceou no-till cropland; present, with vegetation with lacking shrub and Tree stratum (dbh > 3 inches) present resent, with 30% actively grazed spoil lands. either a shrub layer or a tree layer (dbh > 3 30% tree canop cover and a tree stratum, hay production, ponds Riparian with > 60% tree canopy cover and an non-maintained understory. Wetlands to 60% tree anopy cover an pasture, sparsely vegetated nonenuded surface **Buffers** row crops, active maintained open water. If containing both herbaceous and shrub layers or a maintained area feed lots, trails, or inches) present, with <30% tree understory present tree recently seeded other comparable Recent cutover stratum (dbh >3 and stabilized, or conditions. (dense canopy cover. inches) present, with <30% tree non-maintained other comparable vegetation). understory condition. canopy cover with maintained understory Low High High Low High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below. Blocks equal 100 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% CI % Riparian Area> Rt Bank CI > 1.50 Left Bank Score > 1.5 Lt Bank CI > 1.50 1.50 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.75

RCI= (Riparian CI)/2
COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

N/A

INSERT PHOTOS:



Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** Martinsville Connector (VDOT) Henry R4 02070010 3/05/2019 CN N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map SA, JB **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 3.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

Stream Impact Assessment Form Page 2									
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
0.00	Martinsville Connecto	or (VDOT)	Henry	R4	02070010	3/05/2019	CN	0	N/A
I. CHANNEI vestock	L ALTERATION: Stream cross	ings, riprap, conci			traightening of ch	annel, channeliza	tion, embankmen	its, spoil piles, constr	ictions,
	Conditional Category Negligible Minor Moderate Severe							NOTES	
	Negligible	Mi			erate	Sev		NOTES>>	
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chann	of reach is disrupted the alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



	DESCRIBE	PROPOSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** Martinsville Connector (VDOT) Henry R4 02070010 3/05/2019 CR N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map SA, JB **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. 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INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

Stream Impact Assessment Form Page 2									
Project #	Project Name (Applicant) Locality			Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
0.00	Martinsville Connecto	or (VDOT)	Henry	R4	02070010	3/05/2019	CR	0	N/A
4. CHANNE ivestock	L ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil p Conditional Category							rictions,	
	Negligible Minor Moderate Severe							INOTESS.	
	Negligible	Mir			erate	Sev	/ere	NOTES>>	
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chann	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



DESCRIBE PROPOSED IMPACT:	DE	SCR	BE I	PRO	POSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC Class Length **Factor** Martinsville Connector (VDOT) Henry R3 02070010 3/05/2019 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map SA, JB **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

Stream Impact Assessment Form Page 2									
Project #	Project Name (App	licant)	Locality	Cowardin Class.	нис	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
0.00	Martinsville Connecto	or (VDOT)	Henry	R3	02070010	3/05/2019	0	0	N/A
I. CHANNE vestock	L ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions,								
	Conditional Category NOTES>> Negligible Minor Moderate Severe								
	Negligible	Miı			erate	Sev	vere	NOTES>>	
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mod 40 - 60% of reach is disrupted by any of the channel	60 - 80% of reach	Greater than 80% of by any of the chant	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



DESCRIBE PROPOS	SED IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** Martinsville Connector (VDOT) Henry R3 02070010 3/05/2019 CU N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map SA, JB **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. 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RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Area has been Optimal Suboptimal Marginal Poor recently logged. Area Low Marginal lacks vegetation for High Poor: ow Suboptimal Non-maintained stabilization. High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area eed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 0.6 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 0.60 Left Bank Lt Bank CI > 0.60 0.60 0.6 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

	Stream Impact Assessment Form Page 2								
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
0.00	Martinsville Connecto	or (VDOT)	Henry	R3	02070010	3/05/2019	CU	0	N/A
4. CHANNEI	ALTERATION: Stream cross	ings, riprap, conc	rete, gabions, or o	concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer	its, spoil piles, constr	ictions.
	_ ALTERATION: Stream cross		Condition	al Category				nts, spoil piles, constr	ictions,
4. CHANNEI livestock	ALTERATION: Stream cross Negligible			al Category	traightening of characte				ictions,

stream has been

channelized, normal stable

stream meander

pattern has not

0.7

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

channelized, normal stable

stream meander

pattern has not

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

Iterations listed i

the parameter guidelines.

1.3

alterations listed in the parameter guidelines.

1.1

unaltered pattern or has naturalized.

1.5

THE REACH CONDITION INDEX (RCI) >>

1.06

CI

1.50

RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

80% of banks shored with gabion, riprap, or cement.

0.5

INSERT PHOTOS:

SCORE



DESCRIBE	PROPOSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** Martinsville Connector (VDOT) Henry R3 02070010 3/05/2019 CV N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map SA, JB **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. 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INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. populations. than 10% of the reach. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	olicant)	Locality	Cowardin Class.	нис	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
0.00	Martinsville Connecto	or (VDOT)	Henry	R3	02070010	3/05/2019	cv	0	N/A
4. CHANNE livestock	L ALTERATION: Stream cross	sings, riprap, concr			straightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, consti	rictions,
	Conditional Category Negligible Minor Moderate Severe				NO ILS				
	riogngibio	IVIII	nor	IVIOCI	erate	Sev	rere		
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel	Greater than 80% of by any of the chann	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,	I	

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

INSERT PHOTOS:



Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** Martinsville Connector (VDOT) Henry R3 02070010 3/05/2019 CW N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map SA, JB **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. 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0.9

0.5

1.20

High

Score

1.5

	Stream Impact Assessment Form Page 2								
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
0.00	Martinsville Connecto	or (VDOT)	Henry	R3	02070010	3/05/2019	cw	0	N/A
4. CHANNE ivestock	L ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, Conditional Category						ictions,		
								INO 1 E 2>>	
	Negligible	Mir	nor	Mod	erate	Sev	/ere	NOTES>>	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chann	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



DESCRIBE PROPOSED IMPACT:	DE	SCR	BE I	PRO	POSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** Martinsville Connector (VDOT) Henry R3 02070010 3/05/2019 CY N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map SA, JB **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. 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0.9

0.5

1.20

High

Score

1.5

O.00 Martinsville Connector (VDOT) Henry R3 02070010 3/05/2019 CY 0 N/A CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, estock Conditional Category Negligible Minor Moderate Channel Alteration Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Channelization, credging, alteration, isted in the parameter guidelines. If stream has been channelized, in the parameter guidelines. If stream has been channelized, channelized, or parameter for the parameter guidelines. If stream has been channelized, channelized, or parameter for the parameter guidelines. If stream has been channelized, or parameter for the parameter guidelines AID/OR grows or general for parameter guidelines. If stream has been channelized, or general for parameter guidelines AID/OR grows or general for parameter guidelines AID/OR grows or general for parameter guidelines. If stream has been channelized, or general for parameter guidelines AID/OR grows or general for parameter guidelines AID/OR grows or general for parameter guidelines. If stream has been channelized, or general for parameter guidelines AID/OR grows or general for grows or general for parameter guidelines. If stream has been channelized, grows or general for grows or general fo		St	ream Ir	npact A	ssessn	nent Fo	rm Pag	e 2		
CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, estock Conditional Category	Project #	Project Name (App	licant)	Locality		HUC	Date			Impact Factor
Channel Alteration Channel an unaltered pattern or has naturalized. Channel an unaltered pattern or has naturalized. Conditional Category Moderate 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter with	0.00	Martinsville Connecto	or (VDOT)	Henry	R3	02070010	3/05/2019	CY	0	N/A
Channel Alteration Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, the narmeter than earmeter than the parameter channelized, cha	I. CHANNEI vestock									
Channel Alteration Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Less than 20% of the stream reach its disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, the parameter form the parameter stream has been channelized, the parameter stream has been channelized.		Negligible	Mi	nor	Mod	erate	Se	vere		
guidelines. stream meander pattern has not recovered. recovered.	Channel Alteration	or hardening absent. Stream has an	the stream reach is disrupted by any of the channel alterations listed in the parameter	stream reach is disrupted by any of the channel alterations listed in the parameter	is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not	is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not	Greater than 80% by any of the chan in the parameter g	nel alterations listed guidelines AND/OR nored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2) COMPENSATION REQUIREMENT (CR) >>

N/A CR = RCI X LF X IF

INSERT PHOTOS:



DESCRIBE PRO	POSED IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** Martinsville Connector (VDOT) Henry R3 02070010 3/05/2019 CZ N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map SA, JB **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. 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0.9

0.5

1.20

High

Score

1.5

Stream Impact Assessment Form Page 2									
Project #	Project Name (Applicant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor	
0.00	Martinsville Connector (VDOT)	Henry	R3	02070010	3/05/2019	CZ	0	N/A	
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock									
	Conditional Category								

			Condition	al Category		_	NOTES>:
	Negligible	Mii	nor	Mod	erate	Severe	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	of the channel	is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks shored with gabion, riprap, or cement.	
SCORE	1.5	1.3	1.1	0.9	0.7	0.5	

CI 1.50

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

1.32

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2) COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Open water pond with an inlet and outlet. Inline pond.

Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC Date SAR# **Factor** Class length **Martinsville Connector (VDOT)** 03010103 3/28/19 Henry R6 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map Unnamed Tributary to Marrowbone Creek 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Marginal Suboptimal Poor Low Marginal: Non-maintained High Poor: ow Suboptimal High Suboptima Riparian areas Lawns, mowed Riparian areas High Marginal: dense herbaceou and maintained Low Poor: with tree stratum (dbh > 3 inches) vegetation, riparian areas with tree stratum (dbh > 3 inches) areas, nurseries Impervious lense herbaceou no-till cropland; surfaces, mine present, with vegetation with lacking shrub and Tree stratum (dbh > 3 inches) present resent, with 30% actively grazed spoil lands. either a shrub layer or a tree layer (dbh > 3 tree stratum, hay production, ponds Riparian 30% tree canon with > 60% tree canopy cover and an non-maintained understory. Wetlands to 60% tree anopy cover an pasture, sparsely vegetated nonenuded surface cover and a **Buffers** row crops, active maintained open water. If areas containing both herbaceous and maintained area feed lots, trails, or inches) present, with <30% tree understory present, tree recently seeded other comparable Recent cutover stratum (dbh >3 shrub layers or a and stabilized, or conditions. (dense canopy cover. inches) present non-maintained other comparable vegetation). with <30% tree understory condition. anopy cover wit maintained understory Low Low High High High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums descriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 100% 100% Right Bank Score > 1.2 CI= (Sum % RA * Scores*0.01)/2 100% CI % Riparian Area> 100% Rt Bank CI > 1.20 Left Bank Score > 1.2 Lt Bank CI > 1.20 1.20 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.60 RCI= (Riparian CI)/2 COMPENSATION REQUIREMENT (CR) >> N/A CR = RCI X LF X IF

INSERT PHOTOS:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 03010103 3/4/2019 1-A 86 N/A Henry Name(s) of Evaluator(s) Stream Name and Information Stream Map AM/SB/MH **Unnamed Tributary to Little Marrowbone Creek** S-1: Z1-9/Y1-9 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow egetative protection present on less developed wide bankfull benches be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient than 80% of stream bed is covered by AND/OR V-shaped channels have diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 2.00 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 80% 20% 100% Right Bank Score > 1.5 0.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 100% 100% Rt Bank CI > CI 1.30 Left Bank 1.5 Lt Bank CI > 1.50 1.40 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. **Stream Gradient** CI

Scores

1.5

0.9

0.5

High

1.20

Stream Impact Assessment Form Page 2									
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/4/2019	1-A	86	N/A
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock Conditional Category NOTES>>									
	Negligible	Negligible Mi			nor Moderate				
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter quidelines.	is disrupted by any	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable	Greater than 80% of the chan in the parameter g	of reach is disrupted nel alterations listed guidelines AND/OR lored with gabion, r cement.		

0.7

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.18 RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

> COMPENSATION REQUIREMENT (CR) >> N/A

> > CR = RCI X L_I X IF

0.5

1.30

INSERT PHOTOS:

Scores



Looking upstream at Stream Reach 1-A. The reach was incised with active erosion at a culvert. The right riparian buffer consisted of 80% mature tree cover and 20% impervious surfaces associated with State Route 220. The left riparian buffer consisted of 100% mature tree cover. The instream habitat was present in 30%-50% of the reach and consisted of riffles, pools, leaf packs and substrate of various particle sizes. The channel was riprapped at the culvert upstream.

DESCRIBE	PROPOSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 03010103 4/27/2019 1-B 115 N/A Henry Stream Name and Information Name(s) of Evaluator(s) Stream Map S-1: ZZU1-2, ZZV1-3 JF **Unnamed Tributary to Little Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow egetative protection present on less developed wide bankfull benches be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient than 80% of stream bed is covered by AND/OR V-shaped channels have diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 2.00 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High High High Low Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 100% 100% Rt Bank CI > CI 1.50 Left Bank 1.5 Lt Bank CI > 1.50 1 50 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. Stream Gradient CI

Scores

1.5

0.9

0.5

High

0.50

Stream Impact Assessment Form Page 2										
Project #	Project Name (Applicant)		Project Name (Applicant) Locality Cowardin Class. HUC Date		Date	SAR # / Data Point	Impact / SAR length	Impact Factor		
30544.01	Martinsville Connector (VDOT)		Henry	R3	03010103	4/27/2019	1-B	115	N/A	
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock Conditional Category										
ivestock		go, пртар, осно.			raigntening of cha	annel, channeliza	tion, embankmer		ictions,	
ivestock	Negligible	Mii	Condition				tion, embankmer	NOTES>>	ictions,	

pattern has not 1.3 1.1 0.9 0.7 0.5 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

terations listed in the parameter

guidelines. If

tream has beer

channelized, normal stable

stream meande

terations listed i

the parameter guidelines. If

stream has beer

channelized, normal stable

stream meander pattern has not

recovere

Greater than 80% of reach is disrupted by any of the channel alterations lister in the parameter guidelines AND/OR

80% of banks shored with gabion, riprap, or cement.

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

Less than 20% of

the stream reach s disrupted by an

of the channel

Iterations listed i

the parameter guidelines.

Channelization, dredging, alteration, or hardening absent. Stream has an

unaltered pattern or has naturalized.

1.5

20-40% of the

stream reach is disrupted by any

of the channel

alterations listed in the parameter guidelines.

THE REACH CONDITION INDEX (RCI) >> 0.94 RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

CI

0.70

COMPENSATION REQUIREMENT (CR) >> N/A CR = RCI X L_I X IF

INSERT PHOTOS:

Channel

Alteration

Scores



Looking upstream at Stream Reach 1-B. The stream is often incised with erosion present on both banks. The left bank riparian buffer consists of mature forest with greater than 60% tree canopy cover and impervious surfaces. The right bank consists of a wetland and mature forest with greater than 60% tree canopy cover. Instream habitat is present in less than 10% of the stream. Channel alteration is present in 60-80% of the reach from a concreted culvert and rip-rap.

DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 03010103 3/4/2019 2-A 195 N/A Henry Stream Name and Information Name(s) of Evaluator(s) Stream Map S-2: A1-5/B1-2/C3-8/X1-10/W1-7 AM/SB/MH **Unnamed Tributary to Little Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow egetative protection present on less developed wide bankfull benches be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient than 80% of stream bed is covered by AND/OR V-shaped channels have diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 1.60 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 50% 50% 100% Right Bank Score > 1.5 0.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 50% 50% 100% Rt Bank CI > CI 1.00 Left Bank 1.5 0.5 Lt Bank CI > 1.00 1.00 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat elements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. **Stream Gradient** CI

Scores

1.5

0.9

0.5

High

0.90

Stream Impact Assessment Form Page 2									
Project #	Project Name (Applicant)		Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/4/2019	2-A	195	N/A
4. CHANNEI livestock	L ALTERATION: Stream cross	sings, riprap, conci		concrete blocks, s	traightening of ch	annel, channeliza	ation, embankmer	nts, spoil piles, constr	rictions,
	Negligible	Mi	nor		erate	Se	vere	NOTEGO	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter	is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized.	Greater than 80% by any of the chan in the parameter	inel alterations listed guidelines AND/OR nored with gabion,	!	

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 0.96 RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

1.30

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X L_I X IF

0.5

INSERT PHOTOS:

Scores



Looking upstream at Stream Reach 2-A. The reach was incised with active erosion at a culvert located at the top of the reach. The riparian buffers consist of 50% mature tree cover and 50% impervious surfaces associated with State Route 220. The in-stream habitat is present in 10%-30% of the reach and consisted of riffles, pools, leaf packs and substrate of various particle sizes. The channel was riprapped at the culvert.

DESCRIBE PROPOSED IMPAC	T:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 03010103 3/4/2019 3-A 148 N/A Henry Stream Name and Information Name(s) of Evaluator(s) Stream Map S-3: B1-3/C1-8 AM/SB/MH **Unnamed Tributary to Little Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow egetative protection present on less developed wide bankfull benches be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient than 80% of stream bed is covered by AND/OR V-shaped channels have diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 2.00 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High High High Low Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 100% 100% Rt Bank CI > CI 1.50 Left Bank 1.5 Lt Bank CI > 1.50 1 50 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. **Stream Gradient** CI

Scores

1.5

0.9

0.5

High

0.50

Stream Impact Assessment Form Page 2										
Project #	Project Name (App	licant)	Locality	Cowardin Class.	нис	Date	SAR # / Data Point	Impact / SAR length	Impact Factor	
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/4/2019	3-A	148	N/A	
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock										
		Condition	ai Catedory							
	Negligible	Mi	nor		erate	Sev	/ere	NOTES>>		
Channel Alteration	Negligible Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is	Mod 40 - 60% of reach is disrupted by any of the channel	is disrupted by any of the channel	Greater than 80% of by any of the chang in the parameter of	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.06 RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L_I X IF

INSERT PHOTOS:



Looking downstream at Reach 3-A. The reach was level with stable banks and few areas of active erosion; however, severe aggregation is occurring within the reach due to a collapsed culvert crossing State Route 220 and associated with Reach 2-A. The riparian buffers consisted of 100% mature tree cover and wetlands. The in-stream habitat was present in less than 10% of the reach. The channel had no sign of alteration.

DESCRIBE	PROPOSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 03010103 3/4/2019 4-A 123 N/A Henry Name(s) of Evaluator(s) Stream Name and Information Stream Map AM/SB/MH **Unnamed Tributary to Little Marrowbone Creek** S-4: D1-8/E1-6 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow egetative protection present on less developed wide bankfull benches be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient than 80% of stream bed is covered by AND/OR V-shaped channels have diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 2.00 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 50% 50% 100% Right Bank Score > 1.5 0.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 50% 50% 100% Rt Bank CI > CI 1.00 Left Bank 1.5 0.5 Lt Bank CI > 1.00 1.00 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. Stream Gradient CI

Scores

1.5

0.9

0.5

High

0.50

Stream Impact Assessment Form Page 2										
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor	
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/4/2019	4-A	123	N/A	
4. CHANNEI livestock	L ALTERATION: Stream cross	ings, riprap, conci			traightening of ch	annel, channeliza	ition, embankmer		rictions,	
	Conditional Category NOTES>> Negligible Minor Moderate Severe									
	Negligible	Mi			erate	Se	/ere	NOTES>>		
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chan in the parameter of	of reach is disrupted nel alterations listed juidelines AND/OR ored with gabion,			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

0.88

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L_I X IF

INSERT PHOTOS:



Looking downstream at Stream Reach 4-A. The reach was level with stable banks and had few areas of active erosion, however severe aggregation was present due to restricted flow at the culvert crossing near State Route 220. The riparian buffers consisted of 50% mature tree cover with wetlands and 50% impervious surface associated with State Route 220. The in-stream habitat is present in less then 10% of the reach. Channel alteration was present at a riprapped culvert.

DESCRIBE	PROPOSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R4 03010103 3/6/2019 5-A 92 N/A Henry Name(s) of Evaluator(s) Stream Name and Information Stream Map AM/SB/MH **Unnamed Tributary to Little Marrowbone Creek** S-5: U1-8/V1-7 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow egetative protection present on less developed wide bankfull benches be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sedimen portions of the reach. Transient than 80% of stream bed is covered by diment covers 10-40% of the stream bottom. deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 2.00 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 100% 100% Rt Bank CI > CI 1.50 Left Bank 1.5 Lt Bank CI > 1.50 1 50 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat elements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. **Stream Gradient** CI

Scores

1.5

0.9

0.5

High

1.20

Class. Hoc Date Date Data Point length F. Wartinsville Connector (VDOT) Henry R4 03010103 3/6/2019 5-A 92	Project #	Project Name (Ann					rm Pag	C		
· · · · · · · · · · · · · · · · · · ·		r roject Name (App	olicant)	Locality		HUC	Date	-	•	Impact Factor
	30544.01	Martinsville Connecte	or (VDOT)	Henry	R4	03010103	3/6/2019	5-A	92	N/A
CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constriction stock Conditional Category NOTES>>	CHANNE estock	EL ALTERATION: Stream cross	sings, riprap, conc			traightening of ch	annel, channeliza	ation, embankmer		ctions,
Negligible Minor Moderate Severe		Negligible	Mi			erate	Se	vere	NOTES>>	
Channelization, dredging, alteration or hardening absent. Stream has an unaltered pattern or has naturalized. Channelization diredging, alteration is isided in the parameter guidelines. If stream has been channelized, normal stable stream meander guidelines. If stream has been channelized, normal stable stream meander pattern has not pattern has not pattern has not parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not pattern has not parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not pattern has not parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not parameter guidelines. If stream has not parameter guidelines in the parameter guidelines. If stream has not parameter guidelines and stream has not parameter guidelines. If stream has not parameter guidelines in the parameter guidelines. If stream has not parameter guidelines in the parameter guidelines. If stream has not parameter guidelines in the parameter guidelines. If stream has not parameter guidelines and stream has not parameter guidelines. If stream has not parameter guidelines in the parameter guidelines and stream has not parameter guidel	Channel Alteration	or hardening absent. Stream has an	the stream reach is disrupted by any of the channel alterations listed in the parameter	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter	is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander	is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander	in the parameter of 80% of banks sh	nei aiterations listed guidelines AND/OR lored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.24

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L₁ X IF

INSERT PHOTOS:



Looking upstream at Stream Reach 5-A. The reach had few areas of active erosion. The riparian buffers consisted of 100% mature tree cover. Instream habitatis present in 30%-50% the reach consist of riffles, pools, leaf packs and various particle sizes with minor areas of aggregation throughout. The reach starts at a culvert stabilized with riprap.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 03010103 3/4/2019 6-A 174 N/A Henry Stream Name and Information Name(s) of Evaluator(s) Stream Map S-6: I1-3/I12-19/H1-9/T1-3 AM/SB/MH **Unnamed Tributary to Little Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow egetative protection present on less developed wide bankfull benches be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient than 80% of stream bed is covered by AND/OR V-shaped channels have diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 1.60 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 80% 20% 100% Right Bank Score > 1.5 0.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 80% 20% 100% Rt Bank CI > CI 1.30 Left Bank 1.5 0.5 Lt Bank CI > 1.30 1.30 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat elements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. **Stream Gradient** CI

Scores

1.5

0.9

0.5

High

0.90

Stream Impact Assessment Form Page 2										
Project #	Project Name (Applicant)		Locality	Locality Cowardin Class.		HUC Date		Impact / SAR length	Impact Factor	
30544.01	Martinsville Connector (VDOT)		Henry	R3	03010103	3/4/2019	6-A	174	N/A	
CHANNE	ALTERATION: Character and a				•					
	ALTERATION. Stream cross	ings, riprap, conci		concrete blocks, st	traightening of cha	annel, channeliza	tion, embankmer	nts, spoil piles, constr	ictions,	
ivestock	Negligible		-	al Category	traightening of cha		tion, embankmer	NOTES>>	ictions,	

of the channel Less than 20% of 20-40% of the terations listed in the parameter guidelines. If Iterations listed in the parameter guidelines. If Channel Greater than 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR the stream reach s disrupted by an stream reach is disrupted by any Channelization, dredging, alteration, or hardening absent. Stream has an Alteration of the channel of the channel tream has beer stream has been alterations listed in the parameter guidelines. 80% of banks shored with gabion, riprap, or cement. unaltered pattern or has naturalized. Iterations listed i channelized, normal stable channelized, normal stable the parameter guidelines. stream meande stream meande pattern has not pattern has not recovere 0.5

1.1

CI 0.90

0.9 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

0.7

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

1.3

1.5

THE REACH CONDITION INDEX (RCI) >>

0.94

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L_I X IF

INSERT PHOTOS:

Scores



Looking upstream at Stream Reach 6-A. The reach was incised with active erosion at the culvert at the top of the reach. The riparian buffers consisted of 80% mature tree cover and 20% impervious surfaces associated with State Route 220. Instream habitat is present in 10-30% of the reach and consisted of riffles, pools, leaf packs and substrate of various particle sizes. The channel was riprapped at the culvert.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R4 03010103 3/4/2019 7-A 41 N/A Henry Name(s) of Evaluator(s) Stream Name and Information Stream Map AM/SB/MH **Unnamed Tributary to Little Marrowbone Creek** S-7: K1-4/J2-4 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow egetative protection present on less developed wide bankfull benches be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient than 80% of stream bed is covered by AND/OR V-shaped channels have diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 2.00 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 50% 50% 100% Right Bank Score > 1.2 0.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 50% 50% 100% Rt Bank CI > CI 0.85 Left Bank 1.2 0.5 Lt Bank CI > 0.85 0.85 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. Stream Gradient CI

Scores

1.5

0.9

0.5

High

0.90

Stream Impact Assessment Form Page 2										
Project #	Project Name (App	licant)	Locality	Cowardin Class.	нис	Date	SAR # / Data Point	Impact / SAR length	Impact Factor	
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/4/2019	7-A	41	N/A	
4. CHANNE livestock	L ALTERATION: Stream cross	ings, riprap, conci	rete, gabions, or o		traightening of ch	annel, channeliza	ition, embankmer		ictions,	
	Negligible	Mi	nor	Mod	erate	Se	vere	NOTES>>		
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chan in the parameter g				

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 0.8

0.85

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L_I X IF

INSERT PHOTOS:



Looking upstream at Reach 7-A. The reach was incised with active erosion throughout the reach. The riparian buffers consisted of 50% mature tree cover and 50% impervious surfaces associated with State Route 220. In-stream habitat was present in 10-30% of the reach and consisted of shallow riffles, pools, and a few head-cuts. Greater than 80% of the channel was culverted under State Route 220.

DESCRIBE PROPOSED IMPACT	Γ:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R4 03010103 3/4/2019 7-B 284 N/A Henry Name(s) of Evaluator(s) Stream Name and Information Stream Map AM/SB/MH **Unnamed Tributary to Little Marrowbone Creek** S-7: M 1-17/L1-13 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow egetative protection present on less developed wide bankfull benches be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient than 80% of stream bed is covered by AND/OR V-shaped channels have diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 1.00 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 60% 40% 100% Right Bank Score > 1.2 0.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 60% 40% 100% Rt Bank CI > CI 0.92 Left Bank 1.2 0.5 Lt Bank CI > 0.92 0.92 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. **Stream Gradient** CI

Scores

1.5

0.9

0.5

High

0.50

Stream Impact Assessment Form Page 2										
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor	
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/4/2019	7-B	284	N/A	
4. CHANNE ivestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of cha	annel, channeliza	tion, embankmer	NOTES>>	rictions,	
	Negligible	Mir	nor		erate	Sev	/ere	NOTES>>		
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chang in the parameter g				

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 0.62 RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

> COMPENSATION REQUIREMENT (CR) >> N/A

> > CR = RCI X L_I X IF

INSERT PHOTOS:



Looking upstream at Reach 7-B. The reach was incised with areas of active erosion throughout and severe aggregation in pools and areas of slow-moving water. The riparian buffers consisted of 60% mature tree cover and 40% impervious surfaces associated with State Route 220. In-stream habitat was present in less then 10% of the reach and was degraded due to severe aggregation. 60-80% of the channel was culverted under State Route 220.

DESCRIBE	PROPOSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 03010103 3/5/2019 7-C 578 N/A Henry Name(s) of Evaluator(s) Stream Name and Information Stream Map S-7: AB 1-39/AA1-47 AM/SB/MH **Unnamed Tributary to Little Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow egetative protection present on less developed wide bankfull benches be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient than 80% of stream bed is covered by AND/OR V-shaped channels have diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 1.60 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 90% 10% 100% Right Bank Score > 1.1 1.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 60% 10% 10% 20% 100% Rt Bank CI > CI 1.14 Left Bank 1.5 1.1 0.6 0.75 Lt Bank CI > 1.22 1.18 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat elements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. **Stream Gradient** CI

Scores

1.5

0.9

0.5

High

0.90

Stream Impact Assessment Form Page 2															
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor						
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/5/2019	7-C	578	N/A						
4. CHANNE	L ALTERATION: Stream cross	ings, riprap, conci			traightening of cha	annel, channeliza	ition, embankmer		rictions,						
	Negligible	Mi			erate	Sev	Conditional Category Negligible Minor Moderate Severe								
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	is disrupted by any of the channel alterations listed in the parameter guidelines. If	of the channel alterations listed in	in the parameter of 80% of banks sh	of reach is disrupted								

NOTE: The Cls and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCl) >> 0.92

RCl= (Sum of all Cl's)/5, except if stream is ephemeral RCl = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L_I X IF

INSERT PHOTOS:



Looking downstream at Reach 7-C. The reach was frequently incised with active erosion throughout and near culverts at the top and bottom of the reach. The right riparian buffer consisted of a 90% tree cover with a maintained understory and 10% tree cover with a mature canopy. The left riparian buffer consisted of 60% tree cover with a mature canopy, 10% tree cover with a maintained understory, 10% maintained lawn, and 20% non-maintained herbaceous areas. The in-stream habitat throughout the reach consisted of riffles, pools, leaf packs and substrate of various particle sizes, however, the reach was degraded due to aggregation. The channel was riprapped and channelized at culverts.

ESCRIBE	PROPOSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 03010103 3/5/2019 7-D 734 N/A Henry Stream Name and Information Name(s) of Evaluator(s) Stream Map AM/SB/MH **Unnamed Tributary to Little Marrowbone Creek** S-7: AB40-77, AA48-103 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow egetative protection present on less developed wide bankfull benches be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient than 80% of stream bed is covered by AND/OR V-shaped channels have diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 1.00 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 80% 20% 100% Right Bank Score > 1.5 0.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 80% 20% 100% Rt Bank CI > CI 1.30 Left Bank 1.5 0.5 Lt Bank CI > 1.30 1.30 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. **Stream Gradient** CI

Scores

1.5

0.9

0.5

High

0.90

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (Applicant)		Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/5/2019	7-D	734	N/A
4. CHANNEI	L ALTERATION: Stream cross	ings, riprap, concr			traightening of cha	annel, channeliza	tion, embankmer		rictions,
	Conditional Category Negligible Minor Moderate Severe								
	Negligible	Mir			erate	Sev	vere	NOTES>>	
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chang in the parameter of	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 0.74 RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >>

N/A CR = RCI X L_I X IF

INSERT PHOTOS:



Looking upstream (northeast) at Reach 7-D. The reach was severely incised with active erosion throughout. The riparian buffers consisted of 80% mature tree cover and 20% impervious surfaces associated with State Route 220. The instream habitat throughout the reach consist of riffles, pools, leaf packs and substrate of various particle sizes, however, all habitat elements were degraded by severe aggregation. The channel was culverted under State Route 220 and riprapped at culverts.

DESCRIBE	PROPOSED	IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R4 03010103 3/4/2019 8-A 154 N/A Henry Stream Name and Information Name(s) of Evaluator(s) Stream Map AM/SB/MH **Unnamed Tributary to Little Marrowbone Creek** S-8: O1-11/N1-8/P1-12/Q1-5/R1-11 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe surface protection or natural rock, prominent (80-100%). AND/OR Stable or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow egetative protection present on less developed wide bankfull benches be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient than 80% of stream bed is covered by AND/OR V-shaped channels have diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 2.00 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 40% 60% 100% Right Bank Score > 0.5 1.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 90% 10% 100% Rt Bank CI > CI 1.10 Left Bank 1.5 0.5 Lt Bank CI > 1.40 1.25 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat elements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. **Stream Gradient** CI

Scores

1.5

0.9

0.5

High

0.50

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (Applicant)		Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/4/2019	8-A	154	N/A
4. CHANNEL livestock	L ALTERATION: Stream cross	ings, riprap, conci			traightening of ch	annel, channeliza	tion, embankmer		rictions,
	Conditional Category								
	Mogligible	NA:			arata	Con	1010	NOTES>>	
Channel Alteration	Negligible Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mod 40 - 60% of reach is disrupted by any of the channel	erate 180 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% of by any of the chann in the parameter g	of reach is disrupted nel alterations listed juidelines AND/OR ored with gabion, r cement.		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.01

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2) COMPENSATION REQUIREMENT (CR) >>

N/A CR = RCI X L_I X IF

INSERT PHOTOS:



Looking upstream at Stream Reach 8-A. The reach was marginaly incised with active erosion at a culvert and in a few areas of the reach. The right riparian buffer consisted of 60% mature tree cover and 40% impervious surfaces associated with State Route 220. The left buffer consisted of 90% mature tree cover and 10% impervious surfaces associated with State Route 220. In-stream habitat was present in less then 10% the reach. The channel was riprapped and channelized through a culvert.

DESCRIBE PROPOSED IMPACT	Γ:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 03010103 3/5/2019 9-A 370 N/A Henry Name(s) of Evaluator(s) Stream Name and Information Stream Map S-9: AJ1-4/AH1-28/AI8-13 AM/SB/MH Little Marrowbone Creek 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow egetative protection present on less developed wide bankfull benches be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient than 80% of stream bed is covered by AND/OR V-shaped channels have diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 1.60 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 30% 10% 60% 100% Right Bank Score > 1.5 0.5 0.6 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 30% 70% 100% Rt Bank CI > CI Left Bank 1.5 0.5 Lt Bank CI > 0.80 0.83 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. **Stream Gradient** CI

Scores

1.5

0.9

0.5

High

0.90

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (Applicant) Localit		Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/5/2019	9-A	370	N/A
4. CHANNEL ivestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of cha	annel, channeliza	ition, embankmer	nts, spoil piles, const	rictions,
	Negligible	Mir						NO I ES>>	
			1101	IVIOU	erate	Sev	/ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is	40 - 60% of reach is disrupted by any of the channel	is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the changing the parameter of	of reach is disrupted nel alterations listed juidelines AND/OR ored with gabion,		

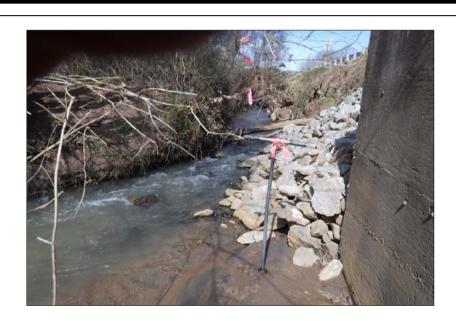
NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 0.81

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A CR = RCI X L_I X IF

INSERT PHOTOS:



DESCRIBE PROPOSED IMPAG	:Т:	
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 03010103 3/5/2019 10-A 224 N/A Henry Name(s) of Evaluator(s) Stream Name and Information Stream Map S-10: AM 1-11/AI1-8 AM/SB/MH Marrowbone Creek 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully developed wide bankfull benches Depositional features contribute to stability. The bankfull and low flow egetative protection present on less be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient AND/OR V-shaped channels have than 80% of stream hed is covered by diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 2.40 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 30% 70% 100% Right Bank Score > 1.5 0.75 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 95% 5% 100% Rt Bank CI > CI 0.98 Left Bank 0.6 0.5 Lt Bank CI > 0.60 0.79 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. Stream Gradient CI

Scores

1.5

0.9

0.5

High

0.50

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/5/2019	10-A	224	N/A
4. CHANNE livestock	L ALTERATION: Stream cross	ings, riprap, conci		concrete blocks, s	traightening of cha	annel, channeliza	tion, embankmer	NOTES>>	rictions,
	Negligible	Mi	nor		erate	Sev	/ere	NOTEOFF	
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chang in the parameter of	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >> 1.00 RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

> COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L_I X IF

INSERT PHOTOS:



Looking upstream at Reach 10-A (Marrowbone Creek). The reach was suboptimal with stable and vegetated banks and a few areas with active erosion. The right riparian buffer consisted of 30% mature forest with wetlands and 70% non-maintained herbaceous areas. The left riparian buffer consisted of 95% maintained residential lawns and 5% impervious surface associated with parking lots and roads. The in-stream habitat consisted of riffles, pools, leaf packs and various particle sizes, however, the stream was degraded by aggregation and pollution. The reach was riprapped and channelized through culverts.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 03010103 3/5/2019 10-B 213 N/A Henry Stream Name and Information Name(s) of Evaluator(s) Stream Map S-10: AM12-21/AR1-5 AM/SB/MH Marrowbone Creek 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. 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RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 50% 50% 100% Right Bank Score > 1.5 0.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 50% 50% 100% Rt Bank CI > CI 1.00 Left Bank 1.5 0.5 Lt Bank CI > 1.00 1.00 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. Stream Gradient CI

Scores

1.5

0.9

0.5

High

0.90

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (Applicant) Locality		Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/5/2019	10-B	213	N/A
4. CHANNEI livestock	L ALTERATION: Stream cross	ings, riprap, conci			traightening of ch	annel, channeliza	tion, embankmer		rictions,
	Conditional Category								
	Magligible	Mi			orato	So.	·oro	NOTES>>	
	Negligible	Mi	nor		erate	Sev	/ere	NOTES>>	
Channel Alteration	Negligible Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is	Mod 40 - 60% of reach is disrupted by any of the channel	60 - 80% of reach is disrupted by any of the channel	Greater than 80% of by any of the changing the parameter of	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 0.80 RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L_I X IF

INSERT PHOTOS:



Looking downstream (west) at Stream Reach 10-B (Marrowbone Creek). The reach channel had active erosion throughout the stream. The riparian buffers consisted of 50% impervious surface associated with State Route 220 and 50% mature forest with wetlands. The in-stream habitat consisted of a deep-water with varying substrate. The channel was altered at the state route 220 bridge crossing Marrowbone Creek.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 03010103 3/5/2019 11-A 212 N/A Henry Name(s) of Evaluator(s) Stream Name and Information Stream Map S-11: BC1-10/BB1-13 AM/SB/MH **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow egetative protection present on less developed wide bankfull benches be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient AND/OR V-shaped channels have than 80% of stream hed is covered by diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 2.00 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 10% 70% 20% 100% Right Bank Score > 1.5 0.75 0.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 65% 20% 15% 100% Rt Bank CI > CI 0.78 Left Bank 0.75 0.5 1.5 Lt Bank CI > 0.81 0.79 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Stable habitat elements are typically Habitat elements listed above are Available present in 30-50% of the reach an are adequate for maintenance of lacking or are unstable. Habitat elements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. Stream Gradient CI

Scores

1.5

0.9

0.5

High

0.50

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/5/2019	11-A	212	N/A
4. CHANNEI livestock	L ALTERATION: Stream cross	ings, riprap, concr			traightening of cha	annel, channeliza	ation, embankmer		ictions,
								INOTES	
	Negligible	Mir	nor	al Category Mod	erate	Sev	vere	NOTES>>	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chan in the parameter g			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 0.92 RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

> COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L_I X IF

INSERT PHOTOS:



Looking upstreamstream at Reach 11-A. The reach channel was marginal with stable and vegetated banks with some areas of erosion. The riparian buffers consisted of impervious surfaces associated with State Route 220 and forested areas with an immature forest/shrub canopy. The in-stream habitat was degraded by severe aggregation. The reach was channelized and riprapped at a culvert under State Route 220.

DESCRIBE PROPOSED IMPACT	Γ:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 03010103 3/6/2019 12-A 203 N/A Henry Name(s) of Evaluator(s) Stream Name and Information Stream Map S-12: AZ1-15/BA1-23 AM/SB/MH **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully developed wide bankfull benches Depositional features contribute to stability. The bankfull and low flow egetative protection present on less be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient AND/OR V-shaped channels have than 80% of stream hed is covered by diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 2.00 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 70% 30% 100% Right Bank Score > 1.2 0.6 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 50% 50% 100% Rt Bank CI > CI 1.02 Left Bank 1.2 0.6 Lt Bank CI > 0.90 0.96 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. Stream Gradient CI

Scores

1.5

0.9

0.5

High

0.50

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/6/2019	12-A	203	N/A
I. CHANNE vestock	L ALTERATION: Stream cross	ings, riprap, concr			traightening of cha	annel, channeliza	tion, embankmer	nts, spoil piles, constr	rictions,
								NOTEC:	
	Negligible	Mir		al Category Mod	erate	Se	/ere	NOTES>>	
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chan in the parameter g	of reach is disrupted nel alterations listed juidelines AND/OR ored with gabion, r cement.		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 0.95 RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >>

N/A CR = RCI X L_I X IF

INSERT PHOTOS:



Looking downstream at Reach 12-A. The reach channel was marginal with stable and vegetated banks with some areas of erosion. The riparian buffers consisted of impervious surfaces associated with State Route 220 and forested areas with an immature forest/shrub canopy. The in-stream habitat was degraded by severe aggregation. The reach was channelized and riprapped at a culvert under State Route 220.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VODT) R3 03010103 3/6/2019 13-A 88 N/A Henry Name(s) of Evaluator(s) Stream Name and Information Stream Map S-13: AY1-19/AX1-10 AM/SB/MH **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully developed wide bankfull benches Depositional features contribute to stability. The bankfull and low flow egetative protection present on less be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient AND/OR V-shaped channels have than 80% of stream hed is covered by diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 2.00 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 60% 40% 100% Right Bank Score > 0.5 1.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 65% 35% 100% Rt Bank CI > CI 0.90 Left Bank 1.5 0.5 Lt Bank CI > 1.15 1.03 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. **Stream Gradient** CI

Scores

1.5

0.9

0.5

High

1.20

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	нис	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VODT)	Henry	R3	03010103	3/6/2019	13-A	88	N/A
4. CHANNE livestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of ch	annel, channeliza	ition, embankmer	nts, spoil piles, constr	rictions,
	Negligible	Mir	nor		erate	Sev	/ere	11012022	
Channel Alteration	Negligible Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel	Greater than 80% of by any of the chan in the parameter g			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

1.11

RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L_I X IF

INSERT PHOTOS:



Looking downstream at Reach 13-A. The reach had active erosion in some areas. The right riparian buffer consisted of 40% mature forested areas and 60% impervious surfaces associated with parking lots and roads. The left riparian buffer consisted of 65% mature forested areas and 35% impervious surface associated with parking lots and roads. The in-stream habitat consisted of riffles, pools, leaf packs and substrate of various particle sizes. The stream was degraded by minor amounts of aggregation. The channel was riprapped and channelized through culverts.

DESCRIBE PROPOSED IMPA	ACT:	
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R4 03010103 3/7/2019 14-A 150 N/A Henry Name(s) of Evaluator(s) Stream Name and Information Stream Map AM/SB/MH **Unnamed Tributary to Marrowbone Creek** S-14: BM1-5/BN1-4/BZ1-6/CA1-6 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow egetative protection present on less developed wide bankfull benches be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient AND/OR V-shaped channels have than 80% of stream hed is covered by diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 1.60 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 40% 15% 45% 100% Right Bank Score > 0.5 0.75 1.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 40% 55% 5% 100% Rt Bank CI > CI 0.99 Left Bank 0.5 1.5 0.75 Lt Bank CI > 1.06 1.03 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. Stream Gradient CI

Scores

1.5

0.9

0.5

High

0.50

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/7/2019	14-A	150	N/A
1. CHANNE ivestock	L ALTERATION: Stream cross	ings, riprap, concr	rete, gabions, or o		traightening of cha	annel, channeliza	ition, embankmer		rictions,
	Negligible	Mir	nor		erate	Sev	/ere	NOTES>>	
Channel Alteration	Negligible Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mode 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chang in the parameter g	of reach is disrupted nel alterations listed juidelines AND/OR ored with gabion, or cernent.		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 0.77

0.77

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L₁ X IF

INSERT PHOTOS:



Looking upstream at Stream Reach 14-A. The reach was poor with frequent, active erosion throughout. The right riparian buffer consisted of 45% mature tree cover, 15% non-maintained herbaceous vegetation, and 40% impervious surfaces associated with State Route 220. The left riparian buffer consisted of 55% mature tree cover, 5% non-maintained herbaceous vegetation, and 40% impervious surfaces associated with State Route 220. The in-stream habitat was degraded by severe erosion. The reach was channelized through culverts.

DESCRIBE PROPOSED IMPA	ACT:	
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 03010103 3/6/2019 15-A 124 N/A Henry Name(s) of Evaluator(s) Stream Name and Information Stream Map S-15: BV1-11/BY1-12 AM/SB/MH **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully developed wide bankfull benches Depositional features contribute to stability. The bankfull and low flow egetative protection present on less be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient AND/OR V-shaped channels have than 80% of stream hed is covered by diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 1.60 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 20% 80% 100% Right Bank Score > 0.5 1.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 80% 20% 100% Rt Bank CI > CI 1.30 Left Bank 0.5 1.2 Lt Bank CI > 0.64 0.97 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. Stream Gradient CI

Scores

1.5

0.9

0.5

High

0.50

	St	tream Ir	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/6/2019	15-A	124	N/A
4. CHANNE ivestock	L ALTERATION: Stream cross	sings, riprap, conc		al Category	straightening of ch	annel, channeliza	ation, embankmer	NOTES>>	ictions,
	Negligible	Mi	nor		erate	Se	vere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander	the parameter guidelines. If stream has been channelized, normal stable stream meander	Greater than 80% by any of the chan in the parameter 80% of banks sl	of reach is disrupted inel alterations listed guidelines AND/OR nored with gabion, or cement.		
				pattern has not recovered.	pattern has not recovered.				

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >> 0.87 RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A CR = RCI X L_I X IF

INSERT PHOTOS:



Looking upstream at Stream Reach 15-A. The reach was incised with active erosion throughout. The right riparian buffer consisted of 80% mature tree cover and 20% impervious surfaces associated with a stockyard. The left riparian buffer consisted of 20% high suboptimal tree cover and 80% impervious surfaces associated with State Route 220. The in-stream habitat was degraded by aggregation, erosion, and highway pollution. The reach was riprapped at the top.

DESCRIBE PROPOSED IMPAC	T:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 03010103 4/27/2019 15-B 151 N/A Henry Stream Name and Information Name(s) of Evaluator(s) Stream Map S-15: ZZS14, ZZT1-3 JF **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully developed wide bankfull benches Depositional features contribute to stability. The bankfull and low flow egetative protection present on less be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sedimen portions of the reach. Transient than 80% of stream bed is covered by diment covers 10-40% of the stream bottom. deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 2.40 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 100% 100% Rt Bank CI > CI 1.50 Left Bank 1.5 Lt Bank CI > 1.50 1 50 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. Stream Gradient CI

Scores

1.5

0.9

0.5

High

0.50

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	4/27/2019	15-B	151	N/A
4. CHANNEl livestock	L ALTERATION: Stream cross	ings, riprap, concr			traightening of ch	annel, channeliza	tion, embankmer		rictions,
	Negligible	Mir		al Category	erate	Sev	/ere	NOTES>>	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in	20-40% of the	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized,	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized,	Greater than 80% of by any of the chann in the parameter g	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		
		the parameter guidelines.	guidelines.	normal stable stream meander pattern has not recovered.	normal stable stream meander pattern has not recovered.	1 3173			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.18

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L_I X IF

INSERT PHOTOS:



Looking downstream at Stream Reach 15-B. The stream is slightly incised and a majority of stable banks with 60-80% vegetative surface protection. The left and right bank riparian buffers consist of mature forest with greater than 60% tree canopy cover. Instream habitat is present in less than 10% of the stream. No channel alteration is present within the stream.

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Looking downstream at Stream Reach 15-B.G110

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R4 03010103 3/7/19 16-A 223 N/A Henry Name(s) of Evaluator(s) Stream Name and Information Stream Map S-16: BQ1-14/BR1-11 AM/SB/MH **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully developed wide bankfull benches Depositional features contribute to stability. The bankfull and low flow egetative protection present on less be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient AND/OR V-shaped channels have than 80% of stream hed is covered by diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 1.00 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 10% 90% 100% Right Bank Score > 0.75 1.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 95% 5% 100% Rt Bank CI > CI 1.43 Left Bank 0.75 0.5 Lt Bank CI > 0.74 1.08 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. Stream Gradient CI

Scores

1.5

0.9

0.5

High

0.50

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/7/19	16-A	223	N/A
4. CHANNE livestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of cha	annel, channeliza	ation, embankmer	nts, spoil piles, const	rictions,
	Negligible	Mir	nor		erate	Se	vere	NOTES	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is	is disrupted by any of the channel alterations listed in the parameter guidelines. If	of the channel	by any of the chan in the parameter of 80% of banks sh	of reach is disrupted nel alterations listed guidelines AND/OR lored with gabion, r cement.	I	

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >> 0.62 RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L_I X IF

INSERT PHOTOS:



Looking upstream at Stream Reach 16-A. The reach was severely incised with frequent, active erosion throughout. The right riparian buffer consisted of 90% mature tree cover and 10% non-maintained herbaceous vegetation. The left riparian buffer consisted of 95% non-maintained herbaceous vegetation and 5% impervious surfaces associated with State Route 220. The in-stream habitat was degraded by severe erosion and lack of habitat elements. Greater then 80% of the reached was channelized into a concert culvert.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 03010103 3/7/2019 17-A 98 N/A Henry Name(s) of Evaluator(s) Stream Name and Information Stream Map AM/SB/MH **Unnamed Tributary to Marrowbone Creek** S-17: BA1-11/BT1-21/BQ13-14 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully developed wide bankfull benches Depositional features contribute to stability. The bankfull and low flow egetative protection present on less be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient AND/OR V-shaped channels have than 80% of stream hed is covered by diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 1.00 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 85% 15% 100% Right Bank Score > 1.5 0.75 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 85% 15% 100% Rt Bank CI > CI 1.39 Left Bank 1.5 0.75 Lt Bank CI > 1.39 1.39 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. Stream Gradient CI

Scores

1.5

0.9

0.5

High

0.50

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/7/2019	17-A	98	N/A
4. CHANNE	L ALTERATION: Stream cross	ings, riprap, conci	rete, gabions, or o	concrete blocks, s	traightening of cha	annel, channeliza	tion, embankmer	nts, spoil piles, consti	rictions,
			Conditions	al Category				NOTES	
	Negligible	Min	Condition	al Category	erate	Sev	vere	NOTES>>	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mode 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chan in the parameter g			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 0.84

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L_I X IF

INSERT PHOTOS:



Looking upstream at Reach 17-A. The reach was severely incised with frequent, active erosion throughout. The riparian buffers consisted of 85% mature tree cover and 15% impervious surfaces associated with State Route 220. The in-stream habitat was degraded by severe aggregation. The reach was channelized riprapped at a culvert.

DESCRIBE PROPOSED IMPAC	Γ:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R4 03010103 3/6/2019 18-A 164 N/A Henry Name(s) of Evaluator(s) Stream Name and Information Stream Map AM/SB/MH **Unnamed Tributary to Marrowbone Creek** S-18: BE1-14/BD1-2,22/BF1-12 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully developed wide bankfull benches Depositional features contribute to stability. The bankfull and low flow egetative protection present on less be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient AND/OR V-shaped channels have than 80% of stream hed is covered by diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 1.60 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 80% 20% 100% Right Bank Score > 1.2 0.6 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 80% 20% 100% Rt Bank CI > CI 1.08 Left Bank 1.2 0.6 Lt Bank CI > 1.08 1.08 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. **Stream Gradient** CI

Scores

1.5

0.9

0.5

High

0.90

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	нис	Date	SAR # / Data Point	Impact / SAR length	Factor N/A
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/6/2019	18-A	164	N/A
4. CHANNE ivestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of cha	annel, channeliza	ation, embankmer	NOTES>>	rictions,
	Negligible	Mir						NO LES>>	
			nor	Mod	erate	Sev	vere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chan in the parameter g			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 0.98

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L_I X IF

INSERT PHOTOS:



Looking upstream at Stream Reach 18-A. The reach channel was poor with sediment covering a large portion of the bed. The riparian buffers consist of 20% impervious surface associated with State Route 220 and 80% mature forested areas. Instream habitat was present and consisted of riffles, pool, head-cuts and leaf packs, however, the reach was degraded by aggregation. The reach was channelized through a culvert and was riprapped for stability.

DESCRIBE	PROPOSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 03010103 3/10/2019 19-A 105 N/A Henry Name(s) of Evaluator(s) Stream Name and Information Stream Map S-19: CO18-88/CR1-11 AM/SB/MH **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow egetative protection present on less developed wide bankfull benches be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient AND/OR V-shaped channels have than 80% of stream hed is covered by diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 1.00 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 90% 10% 100% Right Bank Score > 1.5 0.6 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 40% 30% 30% 100% Rt Bank CI > CI 1.41 Left Bank 1.5 0.75 0.5 Lt Bank CI > 0.98 1.19 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. Stream Gradient CI

Scores

1.5

0.9

0.5

High

0.50

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	нис	Date	SAR # / Data Point	Impact / SAR length	Factor N/A
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/10/2019	19-A	105	N/A
4. CHANNE ivestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of ch	annel, channeliza	ation, embankmer	NOTES>>	rictions,
	Negligible	Mir		Mod	orato	C		NO IES>>	
						Ser	vere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chang in the parameter g	of reach is disrupted		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 0.80 RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L_I X IF

INSERT PHOTOS:



Looking upstream at Reach 19-B. The reach channel was rated severe with frequent areas of active erosion and acute aggregation. The riparian buffers consist of 10% maintained lawns and 90% mature forested areas. In-stream habitat was present in less then 10% of the reach. The reach was channelized through culvert and riprapped for stability at the top of the reach.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 03010103 3/10/2019 20-A 191 N/A Henry Name(s) of Evaluator(s) Stream Name and Information Stream Map S-20: BG3-5/BG26-35 AM/SB/MH **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully developed wide bankfull benches Depositional features contribute to stability. The bankfull and low flow egetative protection present on less be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. likely has access to bankfull benches,or newly developed transient, contribute instability. Deposition that contribute to stability may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sedimen portions of the reach. Transient than 80% of stream bed is covered by diment covers 10-40% of the stream bottom. deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 2.00 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 100% 100% Rt Bank CI > CI 1.50 Left Bank 1.5 Lt Bank CI > 1.50 1 50 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat elements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. **Stream Gradient** CI

Scores

1.5

0.9

0.5

High

0.90

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	нис	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/10/2019	20-A	191	N/A
4. CHANNEI ivestock	L ALTERATION: Stream cross	ings, riprap, conci		concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer		rictions,
	Negligible	Mi	nor		erate	Sev	/ere	NOTES>>	
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chang in the parameter of	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.18 RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >>

N/A CR = RCI X L_I X IF

INSERT PHOTOS:



Looking upstream at Stream Reach 20-A. The reach channel was marginal with areas of active erosion and aggregation. The riparian buffers consist of 100% mature forested areas with wetlands. Instream habitat was present in 10-30% of the reach with many areas degraded by aggregation. The reach showed no signs of alteration.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 03010103 3/10/2019 20-B 416 N/A Henry Stream Name and Information Name(s) of Evaluator(s) Stream Map AM/SB/MH/AW S-20: CO1-5/CO54-77/CM1-10/CN1-3/0 **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully developed wide bankfull benches Depositional features contribute to stability. The bankfull and low flow egetative protection present on less be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sedimen portions of the reach. Transient than 80% of stream bed is covered by diment covers 10-40% of the stream bottom. deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 2.40 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 70% 30% 100% Rt Bank CI > CI 1.50 Left Bank 1.5 0.75 Lt Bank CI > 1.28 1.39 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. **Stream Gradient** CI

Scores

1.5

0.9

0.5

High

1.20

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/10/2019	20-B	416	N/A
4. CHANNE	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, consti	rictions,
	Negligible								
	Negligible	Mii	nor		erate	Sev	ere		
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chang in the parameter g	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >> 1.26

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A CR = RCI X L_I X IF

INSERT PHOTOS:



Looking downstream at 20-B. The reach was suboptimal with minor area of active erosion throughout with stable and vegetated banks. The right riparian buffer consisted of 100% mature tree cover. The left riparian buffer consisted of 70% mature tree cover and 30% densely non-maintained herbaceous area. Instream habitat was present in 30-50% of the reach and consisted of riffles, pools, head cuts, leaf packs and substrate of various particle sizes. The was channelized through culverts at the top and bottom of reach.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 03010103 3/10/2019 21-A 497 N/A Henry Stream Name and Information Name(s) of Evaluator(s) Stream Map AM/SB/MH/AW S-21: CM8-49/CN3-53 **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow egetative protection present on less developed wide bankfull benches be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient AND/OR V-shaped channels have than 80% of stream hed is covered by diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 2.00 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 10% 90% 100% Right Bank Score > 1.5 0.85 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 10% 90% 100% Rt Bank CI > CI 0.92 Left Bank 1.5 0.85 Lt Bank CI > 0.92 0.92 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. **Stream Gradient** CI

Scores

1.5

0.9

0.5

High

1.20

	St	ream Ir	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Factor N/A
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/10/2019	21-A	497	N/A
1. CHANNEI ivestock	L ALTERATION: Stream crossi	ings, riprap, conc	rete, gabions, or o	concrete blocks, s	traightening of cha	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,
			Condition	l Cotomoni				NOTES	
	Negliaible	Mi	Conditiona	al Category	erate	Sev	/ere	NOTES>>	
Channel Alteration	or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is	Modi 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chanr in the parameter g	nei aiterations listed juidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.12

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L_I X IF

INSERT PHOTOS:



Looking upstream at Reach 21-A. The reach was marginal with some active erosion throughout. The riparian buffers consisted of 10% mature tree cover and 90% non-maintained shrub/tree layer. The in-stream habitat consisted of riffles, pools, leaf packs, varied particle sizes, and head-cuts. The reach had no signs of alteration.

DESCRIBE PROPOSED IMPAC	T:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R4 03010103 3/10/2019 21-B 50 N/A Henry Stream Name and Information Name(s) of Evaluator(s) Stream Map AM/SB/MH/AW S-21: CM49-53/CN53-57 **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully developed wide bankfull benches Depositional features contribute to stability. The bankfull and low flow egetative protection present on less be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient AND/OR V-shaped channels have than 80% of stream hed is covered by diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 2.00 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 30% 70% 100% Right Bank Score > 1.5 0.85 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 100% 100% Rt Bank CI > CI 1.05 Left Bank 0.85 Lt Bank CI > 0.85 0.95 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. Stream Gradient CI

Scores

1.5

0.9

0.5

High

0.90

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

0.87

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> CR = RCI X L_I X IF

N/A

INSERT PHOTOS:



Looking upstream at Stream Reach 21-B. The reach was marginal with some active erosion throughout. The right riparian buffer consisted of 30% mature tree cover and 70% non-maintained shrub/tree layer. The left riparian buffer consisted of 100% non-maintained shrub/tree layer. Instream habitat was present 10-30% of the reach and consisted of riffles, pools, leaf packs, substrate of varied particle sizes, and head-cuts, however, the reach was degraded by aggregation.

DESCRIBE PROPOSED IMPAC	Γ:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 03010103 3/6/2019 22-A 111 N/A Henry Name(s) of Evaluator(s) Stream Name and Information Stream Map S-22: BH42-52,BJ1-11 AM/SB/MH **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully developed wide bankfull benches Depositional features contribute to stability. The bankfull and low flow egetative protection present on less be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient than 80% of stream bed is covered by AND/OR V-shaped channels have diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 2.00 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 100% 100% Rt Bank CI > CI 1.50 Left Bank 1.5 Lt Bank CI > 1.50 1 50 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. **Stream Gradient** CI

Scores

1.5

0.9

0.5

High

1.20

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/6/2019	22-A	111	N/A
4. CHANNE ivestock	L ALTERATION: Stream cross	sings, riprap, concr		concrete blocks, s	traightening of ch	annel, channeliza	ation, embankmer	ts, spoil piles, constr	ictions,
	Negligible	Mir	nor		erate	Se	vere	NOTES>>	
Channel Alteration	Channelization, dredging, alteration,	Less than 20% of the stream reach is disrupted by any	20-40% of the stream reach is disrupted by any of the channel	the parameter guidelines. If	of the channel alterations listed in the parameter guidelines. If	Greater than 80%	of reach is disrupted nel alterations listed		
Alteration	or hardening absent. Stream has an unaltered pattern or has naturalized.	of the channel alterations listed in the parameter guidelines.		stream has been channelized, normal stable stream meander pattern has not recovered.	stream has been channelized, normal stable stream meander pattern has not recovered.	80% of banks sh	ored with gabion, r cement.		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.24

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L_I X IF

INSERT PHOTOS:



Looking upstream at Stream Reach 22-A. The reach channel was marginal with common areas of active erosion and sever aggregation. The riparian buffers consist of 100% mature forested areas. Instream habitat was present in 30-50% of the reach and consisted of riffles, pools, head-cuts, leaf packs, and substrate of varied particles sizes. The reach showed no signs of alteration. The reach showed no signs of alteration.

DESCRIBE	PROPOSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 03010103 3/6/2019 22-B 346 N/A Henry Name(s) of Evaluator(s) Stream Name and Information Stream Map S-22: BI2-29,BH15-42 AM/SB/MH **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully developed wide bankfull benches Depositional features contribute to stability. The bankfull and low flow egetative protection present on less be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient than 80% of stream bed is covered by AND/OR V-shaped channels have diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 2.00 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 85% 15% 100% Rt Bank CI > CI 1.50 Left Bank 1.5 0.05 Lt Bank CI > 1.28 1.39 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. Stream Gradient CI

Scores

1.5

0.9

0.5

High

0.90

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/6/2019	22-B	346	N/A
4. CHANNE ivestock	L ALTERATION: Stream cross	ings, riprap, concr	rete, gabions, or o		traightening of cha	annel, channeliza	tion, embankmer	NOTES>>	rictions,
	Negligible	Mir			erate	Sev	/ere	NOTES>>	
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mode 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chang in the parameter g			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.16

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L_I X IF

INSERT PHOTOS:



Looking upstream at stream reach 22-B. The reach channel was marginal with areas of active erosion and frequent aggregation. The right riparian buffer consisted of 100% mature forested areas. The left riparian buffer consisted 85% mature forested areas and 15% impervious surfaces associated with State Route 220. Instream habitat was present in 10-30% of the reach. The reach showed no signs of alteration.

DESCRIBE	PROPOSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 03010103 3/10/2019 23-A 698 N/A Henry Stream Name and Information Name(s) of Evaluator(s) Stream Map AM/SB/MH/AW **Unnamed Tributary to Marrowbone Creek** S-23: BI30-82/BJ12-40/BK1-24 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully developed wide bankfull benches Depositional features contribute to stability. The bankfull and low flow egetative protection present on less be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sedimen portions of the reach. Transient than 80% of stream hed is covered by diment covers 10-40% of the stream bottom. deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 1.60 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 100% 100% Rt Bank CI > CI 1.50 Left Bank 1.5 Lt Bank CI > 1.50 1 50 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. **Stream Gradient** CI

Scores

1.5

0.9

0.5

High

1.20

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/10/2019	23-A	698	N/A
4. CHANNEI livestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of cha	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,
	Negligible			ar oategory					
	Negligible	Mii	nor	Mod	erate	Sev	/ere		
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chang in the parameter of	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.12

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L₁ X IF

INSERT PHOTOS:



Looking upstream at stream reach 23-A. The reach was incised with active erosion throughout. The right riparian buffer consisted of 100% mature tree cover. The left riparian buffer consisted of 100% mature tree cover. Instream habitat was present in 30-50% of the reach. The reach was channelized through culvert at the top of the reach.

DESCRIBE	PROPOSE	D IMPACT.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 03010103 3/8/2019 24-A 186 N/A Henry Name(s) of Evaluator(s) Stream Name and Information Stream Map S-24: CE1-16/CG1-5/CF5-14 AM/SB/MH **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow egetative protection present on less developed wide bankfull benches be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient than 80% of stream bed is covered by AND/OR V-shaped channels have diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 2.40 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 90% 10% 100% Right Bank Score > 1.5 0.6 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 90% 10% 100% Rt Bank CI > CI 1.41 Left Bank 1.5 0.6 Lt Bank CI > 1.41 1 41 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. Stream Gradient CI

Scores

1.5

0.9

0.5

High

0.90

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/8/2019	24-A	186	N/A
l. CHANNE vestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, consti	rictions,
	Negligible	Mir	nor		erate	Se	/ere	NOTES>>	
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chan in the parameter g			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >> 1.20 RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >>

N/A CR = RCI X L_I X IF

INSERT PHOTOS:



Looking upstream at stream reach 24-A. The reach had a few areas of active erosion throughout with stable and vegetated banks. The riparian buffers consisted of 90% mature tree cover and 10% maintained area associated with a gravel farm road. Istream habitat was present in 10-30% of the reach and consisted of riffles, pools, leaf packs and substrate of various particle sizes. The channel was channelized through a culvert under a gravel road.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 03010103 3/8/2019 24-B 185 N/A Henry Name(s) of Evaluator(s) Stream Name and Information Stream Map S-24: CE3-17/CF5-18 AM/SB/MH **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully developed wide bankfull benches Depositional features contribute to stability. The bankfull and low flow egetative protection present on less be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient AND/OR V-shaped channels have than 80% of stream hed is covered by diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 2.00 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 100% 100% Rt Bank CI > CI 1.50 Left Bank 1.5 Lt Bank CI > 1.50 1 50 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. **Stream Gradient** CI

Scores

1.5

0.9

0.5

High

1.20

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/8/2019	24-B	185	N/A
4. CHANNEI ivestock	L ALTERATION: Stream cross	ings, riprap, conci	rete, gabions, or o	concrete blocks, s	traightening of cha	annel, channeliza	tion, embankmer	nts, spoil piles, consti	rictions,
	1		Condition	al Catogory				NOTEC	
	Negligible	Mi	Condition	al Category	erate	Se	/ere	NOTES>>	
Channel Alteration	Negligible Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chan in the parameter g	/ere of reach is disrupted nel alterations listed juidelines AND/OR ored with gabion, r cement.		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.24 RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X L_I X IF

INSERT PHOTOS:



Looking upstream at stream reach 24-B. The reach was marginal with some active erosion throughout. The right riparian buffers consisted of 100% mature tree cover. Instream habitat was present in 30-50% of the reach and consisted of riffles, pools, leaf packs, substrate of varied particle sizes, and head-cuts.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 03010103 3/8/2019 25-A 275 N/A Henry Name(s) of Evaluator(s) Stream Name and Information Stream Map S-25: CG5-23/CF1-5/CH1-15 AM/SB/MH **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully developed wide bankfull benches Depositional features contribute to stability. The bankfull and low flow egetative protection present on less be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sedimen portions of the reach. Transient than 80% of stream bed is covered by diment covers 10-40% of the stream bottom. deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 2.40 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 100% 100% Rt Bank CI > CI 1.50 Left Bank 1.5 Lt Bank CI > 1.50 1 50 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. **Stream Gradient** CI

Scores

1.5

0.9

0.5

High

1.50

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (Applicant)		Locality	ocality Cowardin Class.		Date	Date SAR # / Data Point		Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/8/2019	25-A	275	N/A
4. CHANNEI livestock	L ALTERATION: Stream cross	ings, riprap, conci	rete, gabions, or o	concrete blocks, s	traightening of cha	annel, channeliza	tion, embankmen	nts, spoil piles, constr	rictions,
			Conditions	ol Catogory				NOTEC: .	
	Negligible	Mi	Conditiona nor	al Category Mod	erate	Sev	/ere	NOTES>>	
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chang in the parameter g	/ere		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.38

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L_I X IF

INSERT PHOTOS:



Looking upstream at stream reach 25-A. The reach had a minor area of active erosion throughout with stable and vegetated banks. The riparian buffers consisted of 100% mature tree cover. Instream habitat was present throughout the reach consisted of riffles, pools, head cuts, leaf packs and substrate of various particle sizes. The reach had no signs of alteration.

DESCRIBE PROPOSED IMPAC	Γ:
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Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia

	For use in ephemeral streams										
Project #	Project Name		Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor		
30544.01	Martinsville Connecto	or (VDOT)	Henry	R6	03010103	3/8/2019	26-A	102	N/A		
Name	e(s) of Evaluator(s)	e and Informa	ation				Stream Map				
	AM/SB/MH	ibutary to Ma	rrowbone Cr	eek			S-26: CI1-13/CJ1-13				

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

		Con	ditional Cate	gory				NOTES>>		
	Optimal	Subo	ptimal	Mar	ginal	Po	oor			
Riparian Buffers	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an non-maintained understory. Wetlands areas.	containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
		High	Low	High	Low	High	Low			
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5			
	arian areas along each stream ban	k into Condition C	ategories and Co	ndition Scores us	ing the	Ensure	the sums			
descriptors. 2. Determine sq below.	uare footage for each by measurin	g or estimating ler	ngth and width. C	alculators are pro	ovided for you		Riparian			
	Riparian Area and Score for each ri	parian category in	the blocks below	·		Blocks e	equal 100			
Right Bank	% Riparian Area> 100%						100%			
Tagnit Dank	Score > 1.5									
								CI= (Sum % RA * S	cores*0.01)/2	
Left Bank	% Riparian Area> 100%						100%	Rt Bank CI >	1.50	CI
	Score > 1.5							Lt Bank CI >	1.50	1.50
	REACH C	ONDITION I	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REACH			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Riparian CI)/2

0.75

N/A

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 26-A. The riparian buffers consisted of 100% mature forested areas.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R4 03010103 3/8/2019 27-A 136 N/A Henry Name(s) of Evaluator(s) Stream Name and Information Stream Map S-27: CK6-14/CL5-16 AM/SB/MH **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully developed wide bankfull benches Depositional features contribute to stability. The bankfull and low flow egetative protection present on less be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient than 80% of stream bed is covered by AND/OR V-shaped channels have diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 2.40 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 100% 100% Rt Bank CI > CI 1.50 Left Bank 1.5 Lt Bank CI > 1.50 1 50 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. Stream Gradient CI

Scores

1.5

0.9

0.5

High

0.90

Stream Impact Assessment Form Page 2											
Project #	Project Name (Applicant)		Locality	Cowardin Class.	нис	Date	SAR # / Data Point	Impact / SAR length	Impact Factor		
30544.01	Martinsville Connecto	r (VDOT)	Henry	R4	03010103	3/8/2019	27-A	136	N/A		
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock											
				Conditional Category				INOTEC			
	Negligible	Mir			erate	Sev	/ere	NOTES>>			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mode 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chang in the parameter g					

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.26

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L_I X IF

INSERT PHOTOS:



Looking upstream at stream reach 27-A. The reach was suboptimal with level and stable banks with minor areas of active erosion. The riparian buffers consisted of 100% mature forested areas. Instream habitat was in present in 10-30% of the reach. The channel had no signs of alteration.

DESCRIBE PROPOSED IMPAC	T:
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Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia

	For use in ephemeral streams										
Project #	Project Name		Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor		
30544.01	Martinsville Connecto	or (VDOT)	Henry	R6	03010103	3/8/2019	27-B	64	N/A		
Name	e(s) of Evaluator(s)	e and Informa	ation				Stream Map				
	AM/SB/MH	ibutary to Ma	rrowbone Cr	eek			S-27: CK1-6/CL1-5				

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

			Con	ditional Cate	gory				NOTES>>		
	Optimal		Subo	ptimal	Mar	ginal	Po	or			
Riparian Buffers	Tree stratum (dbh > 3 inches) with > 60% tree canopy cover non-maintained understory. V areas.	present, er and an Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) resent, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.		Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
			High	Low	High	Low	High	Low			
Condition Scores	1.5		1.2	1.1	0.85	0.75	0.6	0.5			
descriptors.	arian areas along each strea			· ·				the sums			
3. Enter the % R	Riparian Area and Score for	r each ripa	arian category in	the blocks below	·.		Blocks e	qual 100			
Right Bank	% Riparian Area> 100							100%			
	Score > 1.	.5									
						10			CI= (Sum % RA * S	Scores*0.01)/2	
Left Bank	% Riparian Area> 100							100%	Rt Bank CI >	1.50	C
	Score > 1.	.5							Lt Bank CI >	1.50	1.5
	REA	CH CC	I NOITION	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REACH			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Riparian CI)/2

0.75

N/A

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 27-B. The riparian buffers consisted of 100% mature forested areas.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 03010103 3/7/2019 28-A 125 N/A Henry Name(s) of Evaluator(s) Stream Name and Information Stream Map S-28: CC6-19/CD1-5 AM/SB/MH **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow egetative protection present on less developed wide bankfull benches be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient than 80% of stream bed is covered by AND/OR V-shaped channels have diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 1.60 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 50% 50% 100% Right Bank Score > 1.5 0.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 70% 30% 100% Rt Bank CI > CI 1.00 Left Bank 1.5 0.5 Lt Bank CI > 1.20 1.10 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. Stream Gradient CI

Scores

1.5

0.9

0.5

High

0.90

Stream Impact Assessment Form Page 2											
Project #	Project Name (Applicant)		Locality	Cowardin Class.	нис	Date	SAR # / Data Point	Impact / SAR length	Impact Factor		
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/7/2019	28-A	125	N/A		
4. CHANNE	L ALTERATION: Stream cross	ings, riprap, concr			traightening of cha	annel, channeliza	ation, embankmer	nts, spoil piles, const	rictions,		
	Negligible	Min	Conditional Category Moderate					NO I LOZZ			
			101	WIOU	erate	Se	vere				
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% by any of the chan in the parameter g					

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 0.98

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L_I X IF

INSERT PHOTOS:



Looking upstream at stream reach 28-A. The reach channel had stable banks but had areas of frequent aggregation. The riparian buffers consist of 50% impervious surface associated with State Route 220, 50% mature forested areas with an unmaintained understory. Instream habitat was present in 10-30% of the reach and consisted of riffles, pools, and head-cuts. The reach was degraded by frequent aggregation. The channel was riprapped at the top of the reach.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 03010103 4/27/2019 28-B 103 N/A Henry Stream Name and Information Name(s) of Evaluator(s) Stream Map JF **Unnamed Tributary to Marrowbone Creek** S-28: ZZJ1-8, ZZK1-5 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully developed wide bankfull benches Depositional features contribute to stability. The bankfull and low flow egetative protection present on less be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sedimen portions of the reach. Transient than 80% of stream bed is covered by diment covers 10-40% of the stream bottom. deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 1.00 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 95% 5% 100% Rt Bank CI > CI 1.50 Left Bank 1.5 0.5 Lt Bank CI > 1.45 1.48 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. Stream Gradient CI

Scores

1.5

0.9

0.5

High

0.50

Stream Impact Assessment Form Page 2											
Project #	Project Name (Applicant)		Locality Cowardin Class. HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor				
30544.01	Martinsville Connector (VDOT) Her			R3	03010103	4/27/2019	28-B	103	N/A		
1. CHANNEI ivestock	L ALTERATION: Stream cross	ings, riprap, conci	rete, gabions, or o	concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, consti	rictions,		
	l		Condition	al Catogory				NOTEC			
	Negligible	l Mir	Condition	al Category	erate	Sev	/ere	NOTES>>			
Channel Alteration	or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chann	nei aiterations listed juidelines AND/OR ored with gabion,				

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 0.90

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L_I X IF

INSERT PHOTOS:



Looking upstream at Stream Reach 28-B. The stream is deeply incised with the streambed below the average majority of banks. The left bank riparian buffer consists of mature forest with greater than 60% tree canopy cover and impervious surfaces. The right bank riparian buffer consists of mature forest with greater than 60% tree canopy cover. Instream habitat is present in less than 10% of the stream. No channel alteration is present in the reach.

DESCRIBE PROPOSED IMPAC	Γ:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 03010103 3/10/2019 29-A 149 N/A Henry Stream Name and Information Name(s) of Evaluator(s) Stream Map AM/SB/MH/AW S-29: CU1-11/CS1-12 **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow egetative protection present on less developed wide bankfull benches be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient AND/OR V-shaped channels have than 80% of stream hed is covered by diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 1.60 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 75% 20% 5% 100% Right Bank Score > 0.85 0.5 1.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 90% 10% 100% Rt Bank CI > CI 0.81 Left Bank 0.85 1.5 Lt Bank CI > 0.92 0.86 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. Stream Gradient CI

Scores

1.5

0.9

0.5

High

0.50

Stream Impact Assessment Form Page 2										
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor	
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/10/2019	29-A	149	N/A	
4. CHANNE ivestock	L ALTERATION: Stream cross	ings, riprap, conci	rete, gabions, or o	concrete blocks, s	traightening of cha	annel, channeliza	tion, embankmer	nts, spoil piles, consti	rictions,	
			Conditions	al Catagory				NOTEO		
	Negligible	Mir		al Category	erate	Sev	/ere	NOTES>>		
Channel Alteration	or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chann	nei aiterations listed juidelines AND/OR ored with gabion,			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 0

0.77

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L₁ X IF

INSERT PHOTOS:



Looking upstream at stream reach 29-A. The reach channel was poor with frequent areas of active erosion throughout. The right riparian buffer consisted of 5% mature forested cover, 75% non-maintained shrub/tree layer, and 20% impervious surface associated with State Route 220. The left riparian buffer consisted of 90% non-maintained shrub/tree layer and 10% mature forested area. Instream habitat consisted of riffles, pools, leaf packs, substrate of varied particle sizes, and head-cuts, however, the reach was degraded by severe aggregation. The reach was filled in by sediment runoff associated with State Route 220.

DESCRIBE	PROPOSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R4 03010103 3/10/2019 30-A 39 N/A Henry Stream Name and Information Name(s) of Evaluator(s) Stream Map AM/SB/MH/AW **Unnamed Tributary to Marrowbone Creek** S-30: CX1-11/CY1-6/DA1-3/CZ1-3 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully developed wide bankfull benches Depositional features contribute to stability. The bankfull and low flow egetative protection present on less be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient AND/OR V-shaped channels have than 80% of stream hed is covered by diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 2.00 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 100% 100% Rt Bank CI > CI 1.50 Left Bank 1.5 Lt Bank CI > 1.50 1 50 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. Stream Gradient CI

Scores

1.5

0.9

0.5

High

1.20

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	# Project Name (Applicant)		Locality	Cowardin Class.	нис	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/10/2019	30-A	39	N/A
4. CHANNE livestock	L ALTERATION: Stream cross	ings, riprap, conci		concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, constr	rictions,
	Negligible			a. catego.,					
	Negligible	Mii	nor		erate	Sev	/ere		
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel	Greater than 80% of by any of the changing the parameter of	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,	1	

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

THE REACH CONDITION INDEX (RCI) >> 1.04

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L_I X IF

INSERT PHOTOS:



Looking downstream at stream reach 30-A. The reach was marginal with some areas of active erosion throughout. The riparian buffer consisted of 100% mature forested cover. Instream habitat present in 30-50% of the reach and consisted of riffles, pools, leaf packs, substrate of varied particle sizes, and head-cuts. The reach was channelized through culverts and stabilized with riprap.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R4 03010103 3/10/2019 31-A 32 N/A Henry Stream Name and Information Name(s) of Evaluator(s) Stream Map AM/SB/MH/AW S-31: DQ6-18/DR7-11 **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully developed wide bankfull benches Depositional features contribute to stability. The bankfull and low flow egetative protection present on less be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient than 80% of stream bed is covered by AND/OR V-shaped channels have diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 2.40 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 40% 60% 100% Right Bank Score > 1.5 0.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 100% 100% Rt Bank CI > CI 0.90 Left Bank 1.5 Lt Bank CI > 1.50 1.20 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. Stream Gradient CI

Scores

1.5

0.9

0.5

High

0.90

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/10/2019	31-A	32	N/A
4. CHANNEI ivestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, consti	rictions,
	Negligible	Miı	nor		erate	Sev	/ere		
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chann	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		

THE REACH CONDITION INDEX (RCI) >> 1.16

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L_I X IF

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

INSERT PHOTOS:



Looking upstream at stream reach 31-A. The reach was suboptimal with few areas of active erosion and level vegetated banks. The right riparian buffer consisted of 40% mature forested cover and 60% impervious surfaces associated with State Route 220. The right riparian buffer consisted of 100% mature forested cover. Instream habitat was present in 10-30% of the reach and consisted of riffles, pools, and head-cuts, however, the reach was degraded by aggregation throughout. The reach was channelized through a culvert at the top of reach.

DESCRIBE	PROPOSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 03010103 3/10/2019 31-B 290 N/A Henry Stream Name and Information Name(s) of Evaluator(s) Stream Map AM/SB/MH/AW S-31: DS1-17/DT1-17/DQ8-11 **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully developed wide bankfull benches Depositional features contribute to stability. The bankfull and low flow egetative protection present on less be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient AND/OR V-shaped channels have than 80% of stream hed is covered by diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 1.60 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceou and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 30% 70% 100% Rt Bank CI > CI 1.50 Left Bank 1.5 0.5 Lt Bank CI > 0.80 1.15 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. Stream Gradient CI

Scores

1.5

0.9

0.5

High

0.90

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	нис	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/10/2019	31-B	290	N/A
4. CHANNE ivestock	L ALTERATION: Stream cross	ings, riprap, concr			traightening of cha	annel, channeliza	tion, embankmer		rictions,
								INOTEC	
	Negligible	Mir	nor	al Category Mode	erate	Sev	vere	NOTES>>	
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mode 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chann	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 0.99 RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L_I X IF

INSERT PHOTOS:



Looking upstream at stream reach 31-B. The reach was poor with frequent areas of active erosion. The right riparian buffer consisted of 100% mature forested areas. The left riparian buffer consisted of 30% mature forested areas and 70% impervious surfaces. The in-stream habitat consisted of riffles, pools, leaf packs, and head-cuts, however, the reach was degraded by aggregation. The reach was channelized through a culvert.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R4 03010103 3/10/2019 32-A 26 N/A Henry Stream Name and Information Name(s) of Evaluator(s) Stream Map AM/SB/MH/AW S-32: DU1-11 **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully developed wide bankfull benches Depositional features contribute to stability. The bankfull and low flow egetative protection present on less be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient than 80% of stream bed is covered by AND/OR V-shaped channels have diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 2.40 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 100% 100% Rt Bank CI > CI 1.50 Left Bank 1.5 Lt Bank CI > 1.50 1 50 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. Stream Gradient CI

Scores

1.5

0.9

0.5

High

0.90

	St	ream Ir	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (Applicant)		Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/10/2019	32-A	26	N/A
4. CHANNEI livestock	L ALTERATION: Stream cross	ings, riprap, conc		concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,
	Negligible	Mi	nor		erate	Sev	/ere	NOTES	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	is disrupted by any of the channel alterations listed in the parameter guidelines. If	180 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	by any of the chant	nei aiterations listed juidelines AND/OR ored with gabion,		
Scores	1.5	1.3	1.1	0.9	0.7	0	.5		
	REACH (CONDITION	NDEX and S	STREAM CO	NDITION UN	IITS FOR TH	IIS REACH		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.22 RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X L_I X IF

INSERT PHOTOS:



Looking upstream at stream reach 32-A. The reach was marginal with vegetated banks and some areas of active erosion. The riparian buffers with 100% mature forested areas. Instream habitat was present in 10-30% of the reach and consisted of riffles, pools, leaf packs, and head-cuts. The reach was channelized through a culvert at the bottom of the reach.

DESCRIBE PROPOSED IMPAC	T:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R4 03010103 3/10/2019 33-A 8 N/A Henry Stream Name and Information Name(s) of Evaluator(s) Stream Map AM/SB/MH/AW S-33: DB1-6/DC1-6 **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow egetative protection present on less developed wide bankfull benches be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient than 80% of stream bed is covered by AND/OR V-shaped channels have diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 2.40 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 20% 80% 100% Right Bank Score > 0.5 1.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 20% 80% 100% Rt Bank CI > CI 1.30 Left Bank 0.5 1.5 Lt Bank CI > 1.30 1.30 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. Stream Gradient CI

Scores

1.5

0.9

0.5

High

0.90

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (Applicant)		Locality	Cowardin Class.	нис	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/10/2019	33-A	8	N/A
4. CHANNEL livestock	L ALTERATION: Stream cross	ings, riprap, conci			traightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,
				al Category				NOTES>>	
	Negligible	Mi	nor		erate	Sev	ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	is disrupted by any of the channel	Greater than 80% of by any of the chain in the parameter g 80% of banks sh riprap, or	nel alterations listed uidelines AND/OR ored with gabion,		
Scores	1.5	1.3	1.1	0.9	0.7	0	.5		
		CONDITION							

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.18

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L_I X IF

INSERT PHOTOS:



Looking upstream at stream reach 33-A. The reach was suboptimal with level and stablized banks. The riparian buffer consisted of 80% mature forested cover and 20% impervious surfaces associated with State Route 220. Instream habitat was present in 10-30% of the reach and consisted of riffles, pools, and varied particle sizes. The reach was channelized through culverts.

DESCRIBE PROPOSED IMPAC	Γ:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R4 03010103 3/10/2019 34-A 52 N/A Henry Stream Name and Information Name(s) of Evaluator(s) Stream Map AM/SB/MH/AW **Unnamed Tributary to Marrowbone Creek** S-34:DD1-4/DE1-5/DG1-4/DF1-3 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow egetative protection present on less developed wide bankfull benches be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient AND/OR V-shaped channels have than 80% of stream hed is covered by diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 1.00 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover ar either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 75% 25% 100% Right Bank Score > 1.5 0.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 75% 25% 100% Rt Bank CI > CI 1.25 Left Bank 1.5 0.5 Lt Bank CI > 1.25 1.25 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. Stream Gradient CI

Scores

1.5

0.9

0.5

High

0.50

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (Applicant)		me (Applicant) Locality	Cowardin HU	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/10/2019	34-A	52	N/A
4. CHANNEI livestock	L ALTERATION: Stream cross	ings, riprap, conci		concrete blocks, s	traightening of ch	annel, channeliza	ition, embankmer	nts, spoil piles, consti	rictions,
	Negligible	Mi	nor		erate	Sev	/ere	NOTES	
				40 - 60% of reach	160 - 80% of reach				
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	is disrupted by any	in the parameter g	nei aiterations listed juidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 0.77 RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A CR = RCI X L_I X IF

INSERT PHOTOS:



Looking upstream at stream reach 34-A. The reach was poor frequent areas of active erosion. The riparian buffers consisted of 75% mature forested cover and 25% impervious surfaces associated with State Route 220. Instream habitat was degraded by erosion and is present in less then 10% of the reach. The reach was channelized through culverts.

Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Project # Project Name Locality Cowardin Class. HUC Date SAR # Impact/SAR length Factor

	Project #	Project Name		Project Name		Locality	Class.	HUC	Date	SAR #	Impact/SAR length	Factor
	30544.01	Martinsville Connect	or (VDOT)	Henry	R6	03010103	3/10/2019	35-A	84	N/A		
ľ	Name	e(s) of Evaluator(s)	e and Inform	ation		Stream Map						
ſ	^	M/SB/MU/AW	ibutary to Ma	rrowbono Cr	ook			S-25: DH1-10	DI1-10			

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

			Con	ditional Cate	gory				NOTES>>		
	Optima	al	Subo	ptimal	Mar	ginal	Po	oor			
Riparian Buffers	Tree stratum (dbh > 3 ir with > 60% tree canopy non-maintained underst areas.	nches) present, y cover and an	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
			High	Low	High	Low	High	Low			
Condition Scores	1.5		1.2	1.1	0.85	0.75	0.6	0.5			
descriptors.	rian areas along each						Ensure	the sums			
Determine squeen below.	uare footage for each	by measuring	g or estimating ler	ngth and width. C	alculators are pro	ovided for you	of % F	Riparian			
3. Enter the % R	Riparian Area and Sco	ore for each rip	parian category in	the blocks below	'.		Blocks e	equal 100			
Right Bank	% Riparian Area>	20%	80%					100%			
g Duin	Score >	0.5	1.5								
									CI= (Sum % RA * S	Scores*0.01)/2	
Left Bank	% Riparian Area>	20%	80%					100%	Rt Bank CI >	1.30	CI
	Score >	0.5	1.5						Lt Bank CI >	1.30	1.30
		REACH C	ONDITION I	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REACH			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Riparian CI)/2

0.65

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking dwonstream at stream reach 35-A. The riperian buffers consisted of 20% impervious surfaces associated with State Route 220 and 80% forested areas with wetlands.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R4 03010103 3/10/2019 36-A 13 N/A Henry Stream Name and Information Name(s) of Evaluator(s) Stream Map AM/SB/MH/AW S-36: DJ1-4/DK1-4 **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow egetative protection present on less developed wide bankfull benches be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient AND/OR V-shaped channels have than 80% of stream hed is covered by diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 2.00 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 75% 25% 100% Right Bank Score > 0.85 0.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 75% 25% 100% Rt Bank CI > CI 0.76 Left Bank 0.85 0.5 Lt Bank CI > 0.76 0.76 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. Stream Gradient CI

Scores

1.5

0.9

0.5

High

0.50

Project # Project Name (Applicant) Locality Cowardin Class. HUC Date SAR # / Data Point length Fac 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 3/10/2019 36-A 13 N/ CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, restock Conditional Category Negligible Minor Moderate Severe 40 - 80% of reach 80 - 80% of reach 180 - 80% of reach 18
CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, restock Conditional Category Negligible Minor Moderate Severe 40 - 60% of reach 80 - 80% of reach
Conditional Category NOTES>> Negligible Minor Moderate Severe 40 - 60% of reach 80 - 80%
Negligible Minor Moderate Severe
40 - 60% of reach 60 - 80% of reach
Channel Alteration Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered. Stream meander pattern has not recovered. Stream meander pattern has not recovered.

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 0.87 RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L_I X IF

INSERT PHOTOS:



Looking downstream at stream reach 36-A. The reach was marginal with some areas of active erosion. The riparian buffers consisted of 75% non-maintained herbaceous areas and 25% impervious surfaces associated with State Route 220. Instream habitat was present in less then 10% of the reach. The reach was channelized through a culvert at the top of reach.

DESCRIBE PROPOSED IMPAC	Γ:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R4 03010103 3/11/2019 37-A 106 N/A Henry Stream Name and Information Name(s) of Evaluator(s) Stream Map AM/SB/MH/AW S-37: DN1-15/DW1-18 **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully developed wide bankfull benches Depositional features contribute to stability. The bankfull and low flow egetative protection present on less be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient AND/OR V-shaped channels have than 80% of stream hed is covered by diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 2.00 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 85% 15% 100% Right Bank Score > 1.5 0.75 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 85% 15% 100% Rt Bank CI > CI 1.39 Left Bank 1.1 0.75 Lt Bank CI > 1.05 1.22 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. Stream Gradient CI

Scores

1.5

0.9

0.5

High

0.90

Stream Impact Assessment Form Page 2												
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor			
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/11/2019	37-A	106	N/A			
	L ALTERATION: Stream cross	4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock Conditional Category										
	Negligible	Mir	nor		erate	Sev	vere	NOTES>>				
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mode 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chann	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,					

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

THE REACH CONDITION INDEX (RCI) >> 1.08

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L_I X IF

INSERT PHOTOS:



Looking upstream at stream reach 37-A. The reach was marginal with areas of active erosion and a large amount of sediment covering the stream bed. The right riparian buffers consisted of 85% mature forested areas and 15% non-maintained herbaceous areas. The left riparian buffer consisted of 85% mature forested with a maintained understory and 15% non-maintained herbaceous areas. Instream habitat was present 10-30% of the reach and consisted of riffles, pools, leaf packs, and head-cuts. The reach was channelized through a culvert.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R4 03010103 3/11/2019 38-A 75 N/A Henry Stream Name and Information Name(s) of Evaluator(s) Stream Map AM/SB/MH/AW S-38: DX1-24/DY1-18 **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow egetative protection present on less developed wide bankfull benches be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient AND/OR V-shaped channels have than 80% of stream hed is covered by diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 2.40 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 20% 40% 40% 100% Right Bank Score > 0.5 0.85 1.2 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 20% 40% 40% 100% Rt Bank CI > CI 0.92 Left Bank 0.5 0.85 1.5 Lt Bank CI > 1.04 0.98 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. Stream Gradient CI

Scores

1.5

0.9

0.5

High

0.50

Stream Impact Assessment Form Page 2											
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor		
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/11/2019	38-A	75	N/A		
4. CHANNE ivestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, constr	ictions,		
	Negligible	Mir	nor		erate	Sev	/ere	NOTES>>			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chanr in the parameter g	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,				

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.00

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L_I X IF

INSERT PHOTOS:



Looking upstream at stream reach 38-A. The reach was marginal with vegetated banks and some areas of active erosion. The right riparian buffers consisted of 40% mature forest with less than 60% canopy cover, 40% non-maintained densely vegetated herbaceous areas, and 20% impervious areas associated with State Route 220. Instream habitat was present in less then 10% of the reach. The reach was channelized through a culvert and stabilized with riprap at the top of the reach.

DESCRIBE PROPOSED IMPAC	Γ:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R4 03010103 3/11/2019 39-A 28 N/A Henry Stream Name and Information Name(s) of Evaluator(s) Stream Map AM/SB/MH/AW S-39: EL1-3,EM1-3,EJ1-4,E **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow egetative protection present on less developed wide bankfull benches be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient AND/OR V-shaped channels have than 80% of stream hed is covered by diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 2.00 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 70% 20% 10% 100% Right Bank Score > 1.5 0.6 0.85 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 70% 20% 10% 100% Rt Bank CI > CI 1.26 Left Bank 1.5 0.6 0.85 Lt Bank CI > 1.26 1.26 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Stable habitat elements are typically Habitat elements listed above are Available present in 30-50% of the reach an are adequate for maintenance of lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. Stream Gradient CI

Scores

1.5

0.9

0.5

High

0.50

Stream Impact Assessment Form Page 2										
Project #	Project Name (App	licant)	Locality	Cowardin Class.	нис	Date	SAR # / Data Point	Impact / SAR length	Impact Factor	
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/11/2019	39-A	28	N/A	
4. CHANNEI livestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of cha	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,	
	Negligible	Mir						NO I LOZZ		
		IVIII	nor	Mod	erate	Sev	/ere			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chan in the parameter g	of reach is disrupted			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 0.85

0.00

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L_I X IF

INSERT PHOTOS:



Looking downstream at stream reach 39-A. The reach was poor with frequent areas of active erosion. The riparian buffers consisted of 70% mature forested areas, 20% maintained lawns, and 10% non-maintained densely vegetated herbaceous areas. Instream habitat was present in less then 10% of the reach. The reach was channelized through a culverts.

DESCRIBE PROPOSED IMPAC	Γ:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 03010103 3/10/2019 39-B 445 N/A Henry Stream Name and Information Name(s) of Evaluator(s) Stream Map AM/SB/MH/AW S-39: DN1-53/DP1-45 **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow egetative protection present on less developed wide bankfull benches be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient AND/OR V-shaped channels have than 80% of stream hed is covered by diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 2.00 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 90% 10% 100% Right Bank Score > 1.5 0.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 90% 10% 100% Rt Bank CI > CI 1.40 Left Bank 1.5 0.5 Lt Bank CI > 1.40 1.40 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. Stream Gradient CI

Scores

1.5

0.9

0.5

High

0.50

Stream Impact Assessment Form Page 2												
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor			
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/10/2019	39-B	445	N/A			
	L ALTERATION: Stream cross	4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock Conditional Category										
	Negligible	Mir	nor		erate	Sev	vere	NOTES>>				
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mode 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chann	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,					

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.00

1.00

RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X L_I X IF

INSERT PHOTOS:



Looking downstream at stream reach 39-B. The reach channel was marginal with some areas of active erosion throughout. The riparian buffers consisted of 90% mature forested cover and 10% impervious surface associated with State Route 220. Instream habitat was present in less then 10% of ther reach. The reach was channelized through culverts and stabilized with riprap at the top and bottom of the the reach.

DESCRIBE	PROPOSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R4 03010103 3/11/2019 39-C 176 N/A Henry Stream Name and Information Name(s) of Evaluator(s) Stream Map AM/SB/MH/AW S-39: DZ1-14/EA1-8 **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully developed wide bankfull benches Depositional features contribute to stability. The bankfull and low flow egetative protection present on less be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient AND/OR V-shaped channels have than 80% of stream hed is covered by diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 1.60 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 90% 10% 100% Right Bank Score > 1.5 0.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 40% 60% 100% Rt Bank CI > CI 1.40 Left Bank 1.5 0.75 Lt Bank CI > 1.05 1.23 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. Stream Gradient CI

Scores

1.5

0.9

0.5

High

0.50

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	нис	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/11/2019	39-C	176	N/A
4. CHANNEL livestock	L ALTERATION: Stream cross	ings, riprap, conci			traightening of ch	annel, channeliza	tion, embankmer		rictions,
			Condition	ai Category				NOTES>>	
	Modligible	Mi			orato	Sou	(Oro	NOTES	
	Negligible	Mir	nor		erate	Sev	/ere	NOTES	
Channel Alteration	Negligible Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is	Mod 40 - 60% of reach is disrupted by any of the channel	60 - 80% of reach is disrupted by any of the channel	Greater than 80% of by any of the chann	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 0.93

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L_I X IF

INSERT PHOTOS:



Looking downstream at stream reach 39-C. The reach was poor with frequent areas of active erosion. The right riparian buffers consisted of 90% mature forested areas and 10% impervious surfaces associated with State Route 220. The left riparian buffer consisted of 40% mature forested and 60% non-maintained herbaceous vegetation. Intream habitat was present in less then 10% of the reach and degraded by severe aggregation and active erosion. The reach was channelized through a culvert at the top of reach.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 03010103 3/11/2019 39-B 39 N/A Henry Stream Name and Information Name(s) of Evaluator(s) Stream Map AM/SB/MH/AW S-39: DZ14-20 **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully developed wide bankfull benches Depositional features contribute to stability. The bankfull and low flow egetative protection present on less be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient AND/OR V-shaped channels have than 80% of stream hed is covered by diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 1.00 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 90% 10% 100% Right Bank Score > 1.5 0.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 20% 80% 100% Rt Bank CI > CI 1.40 Left Bank 1.5 0.5 Lt Bank CI > 0.70 1.05 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. Stream Gradient CI

Scores

1.5

0.9

0.5

High

0.50

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/11/2019	39-B	39	N/A
. CHANNE restock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of cha	annel, channeliza	ition, embankmer	nts, spoil piles, constr	ictions,
	Negligible	Mir			erate	Sev	1020	NOTES>>	
	_					00,	/ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	au - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chann in the parameter g	of reach is disrupted		

THE REACH CONDITION INDEX (RCI) >>

0.81

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L_I X IF

INSERT PHOTOS:



Looking downstream at stream reach 39-D. The reach was severly incised with frequent areas of active erosion. The right riparian buffers consisted of 90% mature forest and 10% impervious surfaces associated with State Route 220. The left riparian buffer consisted of 20% mature forest and 80% impervious surfaces associated with State Route 220. The instream habitat consisted of riffles, pools, leaf packs, and head-cuts, however, the reach was degraded by severe aggregation and active erosion. The reach was channelized through a culvert.

DESCRIBE	PROPOSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 03010103 3/11/2019 40-A 182 N/A Henry Stream Name and Information Name(s) of Evaluator(s) Stream Map AM/SB/MH/AW S-40: EC1-17/ED5-29 **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully developed wide bankfull benches Depositional features contribute to stability. The bankfull and low flow egetative protection present on less be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient AND/OR V-shaped channels have than 80% of stream hed is covered by diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 1.60 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 25% 75% 100% Right Bank Score > 1.5 0.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 25% 75% 100% Rt Bank CI > CI 0.75 Left Bank 1.5 0.5 Lt Bank CI > 0.75 0.75 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. Stream Gradient CI

Scores

1.5

0.9

0.5

High

0.50

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	нис	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/11/2019	40-A	182	N/A
4. CHANNE ivestock	L ALTERATION: Stream cross	ings, riprap, concr			traightening of cha	annel, channeliza	tion, embankmer		rictions,
								INOTEC	
	Negligible	Mir	nor	al Category Mode	erate	Sev	vere	NOTES>>	
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mode 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chann	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 0.71 RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X L_I X IF

INSERT PHOTOS:



Looking downstream at stream reach 40-A. The reach was poor with frequent areas of active erosion. The riparian buffers consisted of 25% mature forested areas and 75% impervious surfaces associated with State Route 220. Instream habitat was present in in less then 10% of the reach and consisted of riffles, pools, leaf packs, and head-cuts, however, the reach was degraded by severe aggregation and active erosion. The reach was channelized through a culvert.

DESCRIBE PROPOSED IMPAC	Γ:
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Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Project # Project Name Locality Cowardin Class. HUC Date SAR # Impact/SAR length Factor

30544.01	Martinsville Connecto	or (VDOT)	Henry	R6	03010103	3/11/2019	40-B	323	N/A
Name	e(s) of Evaluator(s)	Stream Nam	e and Informa	ation				Stream Map	
1	AM/SR/MH/AW	Unnamed Tr	ibutary to Ma	rrowbone Cr	eek			S-40: FF1-6	FG1-6

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

		Cor	ditional Cate	gory				NOTES>>		
	Optimal	Subo	ptimal	Mar	ginal	Po	oor			
Riparian Buffers	Tree stratum (dbh > 3 inches) preser with > 60% tree canopy cover and a non-maintained understory. Wetland areas.	to 60% tree s canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
		High	Low	High	Low	High	Low			
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5			
descriptors.	arian areas along each stream ba		· ·				the sums Riparian			
3. Enter the % R	Riparian Area and Score for each	riparian category ir	the blocks below	I.		Blocks 6	equal 100			
Right Bank	% Riparian Area> 90%	10%					100%			
3	Score > 1.5	0.6]
								CI= (Sum % RA * S	Scores*0.01)/2	
Left Bank	% Riparian Area> 85%	10%	5%				100%	Rt Bank CI >	1.41	CI
	Score > 1.5	0.6	0.5					Lt Bank CI >	1.36	1.39
	REACH	CONDITION I	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REACH			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Riparian CI)/2

0.70

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 40-B. The right riparian buffer consisted of 90% mature forested areas and 10% maintained ride-of-way. The left riparian buffer consisted of 85% mature forested areas, 10% maintained ride-of-way, and 5% impervious surfaces.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 3/4/2019 41-A 520 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-41: DN8-26/DO10-26/DM AO **Unnamed Tributary to Matrimony Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 5% 30% 65% 100% Right Bank Score > 0.5 0.6 1.5 CI= (Sum % RA * Scores*0.01)/2 25% 75% 100% Rt Bank CI > CI % Riparian Area> 1.18 Left Bank Lt Bank CI > 1.28 1.23 0.6 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/4/2019	41-A	520	N/A
I. CHANNEI vestock	L ALTERATION: Stream cross	ings, riprap, concr	rete, gabions, or o	concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,
			A 1'4'	-1.0-1					
	Negligible	Mii		al Category	orato	Sor	voro.	NOTES>>	
Channel Alteration	Negligible Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the channing the parameter of 80% of banks sh	/ere of reach is disrupted nel alterations listed juidelines AND/OR ored with gabion, r cement.		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.19

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2) COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 41-A. The reach had eroded banks with vegetation present. The right riparian buffer consisted of 65% mature tree cover, 30% maintained herbaceous vegetation and 5% impervious surface associated with State Route 220. The left buffer contained 75% mature tree cover and 25% maintained herbaceous vegetation. Instream habitat was suboptimal with stable elements in 30-50% of the reach. No Cchannel alterations was present in the reach.

Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC Date SAR# Class length Factor 30544.01 Martinsville Connector (VDOT) 03010103 3/4/2019 41-B N/A Henry R6 94 Name(s) of Evaluator(s) Stream Name and Information Stream Map Unnamed Tributary to Matrimony Creek S-41: DN1-8/DO1-10 AO 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Marginal Suboptimal Poor Low Marginal: Non-maintained High Poor: ow Suboptimal ligh Suboptima Riparian areas awns, mowed Riparian areas High Marginal: lense herbaceou and maintained Low Poor: with tree stratum (dbh > 3 inches) vegetation, riparian areas with tree stratum (dbh > 3 inches) areas, nurseries Impervious ense herbaceou no-till cropland; surfaces, mine present, with vegetation with lacking shrub and Tree stratum (dbh > 3 inches) present resent, with 30% actively grazed spoil lands. either a shrub layer or a tree layer (dbh > 3 30% tree canop cover and a tree stratum, hay production, ponds Riparian with > 60% tree canopy cover and an non-maintained understory. Wetlands to 60% tree anopy cover an pasture, sparsely vegetated nonenuded surface **Buffers** row crops, active maintained open water. If containing both herbaceous and maintained area feed lots, trails, or inches) present, with <30% tree understory present, tree recently seeded other comparable Recent cutover stratum (dbh >3 shrub layers or a and stabilized, or conditions. (dense canopy cover. inches) present, with <30% tree non-maintained other comparable vegetation). understory condition. canopy cover with maintained understory Low Low High High High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums descriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 50% CI % Riparian Area> 50% Rt Bank CI > 1.50 Left Bank 0.5 1.5 Lt Bank CI > 1.00 1.25 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.63

RCI= (Riparian CI)/2
COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

N/A

INSERT PHOTOS:



Looking upstream at stream reach 41-B. The right riparian buffer consisted of 100% mature tree cover. The left riparian buffer consisted of 50% mature tree cover and 50% imprevious surface associated with State Route 220.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC Data Point Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R4 03010103 3/12/2019 42-A 28 N/A Henry Stream Name and Information Name(s) of Evaluator(s) Stream Map AM/SB/MH/AW S-42: ER1-3/EQ1-3 **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully developed wide bankfull benches Depositional features contribute to stability. The bankfull and low flow egetative protection present on less be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient AND/OR V-shaped channels have than 80% of stream hed is covered by diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 2.00 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 90% 10% 100% Right Bank Score > 1.5 0.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 70% 20% 10% 100% Rt Bank CI > CI 1.40 Left Bank 1.5 0.5 0.6 Lt Bank CI > 1.21 1.31 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. Stream Gradient CI

Scores

1.5

0.9

0.5

High

0.50

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/12/2019	42-A	28	N/A
I. CHANNEI vestock	L ALTERATION: Stream cross	ings, riprap, conci	rete, gabions, or o	concrete blocks, s	traightening of cha	annel, channeliza	tion, embankmen	ts, spoil piles, const	rictions,
TOOLOOK	ı		A 1777	101					
rodioon	Negligible	Min		al Category	erate	Say	vere	NOTES>>	
Channel Alteration	Negligible Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mod 40 - 60% of reach is disrupted by any of the channel	of the channel	Greater than 80% o	nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 0.90

RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

INSERT PHOTOS:



Looking downstream stream reach 42-A. The reach was marginal with areas of active erosion. The right riparian buffer consisted of 90% mature forested areas and 10% impervious surfaces associated with the railroad. The left riparian buffer consisted of 70% mature forested areas, 20% impervious surfaces associated with the railroad, and 10% maintained lawns. Instream habitat elements were less then 10% of the reach. The reach was channelized through a culvert.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 3/4/2019 43-A 832 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-43: DR12/DU1/DP25-87/I AO **Unnamed Tributary to Matrimony Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.50

High

Score

1.5

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/4/2019	43-A	832	N/A
4. CHANNEI livestock	L ALTERATION: Stream cross	ings, riprap, conci		concrete blocks, s	traightening of ch	annel, channeliza	ation, embankmer	NOTES>>	rictions,
	Negligible	Mi	nor		erate	Se	vere	NOTES>>	
				40 - 60% of reach					
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	is disrupted by any of the channel alterations listed in the parameter guidelines. If	is disrupted by any	in the parameter of 80% of banks sh	of reach is disrupted nel alterations listed puidelines AND/OR nored with gabion, r cement.		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 43-A. The reach had incised banks with moderate erosion present. The right and left riparian buffers consisted of 100% mature forest cover. The in-stream habitat was optimal and contained leaf packs, woody debris and various substrate sizes. Channel alterations include concrete installed along less than 20% of the reach.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 3/12/2019 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 43-A 119 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map S-43: DP1-DP8A JB/JF/WN Tributary of Matrimony Creek 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR naiority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 0.6 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > 0.60 CI % Riparian Area> Left Bank Lt Bank CI > 0.60 0.60 0.6 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/12/2019	43-A	119	N/A
4. CHANNE ivestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, constr	ictions,
			Containon	ai Category				INO LESSS	
	Negligible	Mir	nor	Mod	erate	Sev	/ere	NOTES>>	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chanr in the parameter g	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking north (upstream) at Stream Reach 43-A. The reach is often incised with erosion present on 40-60% of banks. The right and left riparian buffers are composed of sparse vegetation and are not maintained. Instream habitat elements are lacking and are present in less than 10% of the reach. The channel had no known alterations.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 3/4/2019 43-B 481 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-43: DP1-25/DQ1-23/DQ1 AO **Unnamed Tributary to Matrimony Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 1.60 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 98% 2% 100% Right Bank 0.85 Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 95% 5% 100% Rt Bank CI > CI % Riparian Area> 1.49 Left Bank 0.85 Lt Bank CI > 1.47 1.5 1.48 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	нис	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/4/2019	43-B	481	N/A
4. CHANNE livestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of ch	annel, channeliza	ation, embankmer	nts, spoil piles, consti	rictions,
	Negligible	Mir				0			
			1101		erate	Se	vere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	is disrupted by any of the channel	Greater than 80% by any of the chan in the parameter \$60% of banks sh	of reach is disrupted nel alterations listed guidelines AND/OR nored with gabion, r cement.	I	

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >>

N/A CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 43-B. The majority of the reach had severely eroded banks with little vegetative protection present. The right and left riparian buffers consisted of 98% and 95% cover by forest with greater than 60% canopy cover, respectfully, which included fringe wetlands. The remaining riparian buffers on both banks consisted of non-maintained dense herbaceous vegetation. The in-stream habitat was suboptimal with stable elements within 30-50% of the reach, and channel alterations occured near State Route 220.

DESCRIBE PROPOSED IMPAC	T:

Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC Date SAR# Class length Factor 30544.01 Martinsville Connector (VDOT) 03010103 3/5/2019 44-A 130 N/A Henry R6 Name(s) of Evaluator(s) Stream Name and Information Stream Map Unnamed Tributary to Matrimony Creek S-44: EA1-7/DZ1-6 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Marginal Suboptimal Poor Low Marginal: Non-maintained High Poor: ow Suboptimal ligh Suboptima Riparian areas awns, mowed Riparian areas High Marginal: lense herbaceou and maintained Low Poor: with tree stratum (dbh > 3 inches) vegetation, riparian areas with tree stratum (dbh > 3 inches) areas, nurseries Impervious ense herbaceou no-till cropland; surfaces, mine present, with vegetation with lacking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% actively grazed spoil lands. either a shrub layer or a tree layer (dbh > 3 30% tree canop cover and a tree stratum, hay production, ponds Riparian with > 60% tree canopy cover and an non-maintained understory. Wetlands to 60% tree anopy cover an pasture, sparsely vegetated nonenuded surface **Buffers** row crops, active maintained open water. If containing both herbaceous and maintained area feed lots, trails, or inches) present, with <30% tree understory present tree recently seeded other comparable Recent cutover stratum (dbh >3 shrub layers or a and stabilized, or conditions. (dense canopy cover. inches) present, with <30% tree non-maintained other comparable vegetation). understory condition. canopy cover with maintained understory Low High Low High High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below. Blocks equal 100 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% CI % Riparian Area> Rt Bank CI > 1.50 Left Bank 1.5 Lt Bank CI > 1.50 1.50 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.75 RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

N/A

INSERT PHOTOS:



Looking upstream at stream reach 44-A. The right and left riparian buffers consisted of 100% mature forest cover.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 3/4/2019 45-A 121 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-45: DR1-12/DS1-10 AW **Unnamed Tributary to Matrimony Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.50

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	нис	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/4/2019	45-A	121	N/A
4. CHANNEI ivestock	L ALTERATION: Stream cross	ings, riprap, conci			traightening of cha	annel, channeliza	ition, embankmer	nts, spoil piles, const	rictions,
			Conditiona	al Category				NOTES	
	Negligible	Mir	Conditiona nor	al Category Mod	erate	Se	/ere	NOTES>>	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the channing the parameter of 80% of banks sh	of reach is disrupted nel alterations listed juidelines AND/OR ored with gabion, r cement.		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 45-A. The reach had stable banks with vegetative protection present. The right and left riparian buffer consisted of 100% mature forest containing wetlands. The in-stream habitat was optimal with stable elements in greather than 50% of the reach.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 3/5/2019 45-B 214 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-45: DU1-25/DS10-25 AO **Unnamed Tributary to Matrimony Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. 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Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 98% 2% 100% Right Bank Score > 1.5 1.2 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.49 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.50

High

Score

1.5

Stream Impact Assessment Form Page 2									
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	r (VDOT)	Henry	R3	03010103	3/5/2019	45-B	214	N/A
4. CHANNE ivestock	L ALTERATION: Stream cross	ings, riprap, conci		concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmen	nts, spoil piles, consti	rictions,
	Negligible	Mi	nor	Mod	erate	Sev	vere	11012022	
Channel Alteration	Negligible Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is	40 - 60% of reach is disrupted by any of the channel	is disrupted by any of the channel	Greater than 80% of by any of the channin the parameter g	of reach is disrupted nel alterations listed uidelines AND/OR		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 45-B. The reach had erosion present on 40-60% of banks. The right riparian buffer consisted of 98% mature forest cover containing wetlands, and 2% forest with 30-60% canopy cover containing a shrub and herbaceous layer. The left riparian buffer consisted of 100% mature tree cover containing wetlands. The in-stream habitat was optimal with stable elements in greather than 50% of the reach. No channel alterations were observed.

DESCRIBE PROPOSED IMPACT:	DE	SCR	BE I	PRO	POSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 3/5/2019 45-C 1,620 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-45: DS25-144/DU25-53/E AO **Unnamed Tributary to Matrimony Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 1.60 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.50

High

Score

1.5

Stream Impact Assessment Form Page 2									
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/5/2019	45-C	1,620	N/A
4. CHANNEL ivestock	ALTERATION: Stream cross	ings, riprap, conc		concrete blocks, s	traightening of ch	annel, channeliza	ition, embankmer	nts, spoil piles, constr	ictions,
	Negligible	Mi	nor		erate	Sev	vere	NO I LOZZ	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is	of the channel	is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not	Greater than 80% of by any of the changing the parameter greater section 100 of banks shadow o	of reach is disrupted nel alterations listed juidelines AND/OR lored with gabion, r cement.		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

1.50

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

0.5

INSERT PHOTOS:

SCORE



Looking upstream at stream reach 45-C. The reach had eroded banks with little vegetative protection present. The right and left riparian buffers consisted of 100% mature forest cover containing wetlands. In-stream habitat was optimal and contained leaf packs, woody debris and various substrate sizes. No channel alteration was present within this reach.

DESCRIBE	PROPOSED	IMPACT:

Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC Date SAR# Class length Factor 30544.01 **Martinsville Connector (VDOT)** 03010103 3/5/2019 46-A 179 N/A Henry R6 Name(s) of Evaluator(s) Stream Name and Information Stream Map AW Unnamed Tributary to Matrimony Creek S-46: DY1-10/DX1-11 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Marginal Suboptimal Poor Low Marginal: Non-maintained High Poor: ow Suboptimal ligh Suboptima Riparian areas awns, mowed Riparian areas High Marginal: lense herbaceou and maintained Low Poor: with tree stratum (dbh > 3 inches) vegetation, riparian areas with tree stratum (dbh > 3 inches) areas, nurseries Impervious ense herbaceou no-till cropland; surfaces, mine present, with vegetation with lacking shrub and Tree stratum (dbh > 3 inches) present resent, with 30% actively grazed spoil lands. either a shrub layer or a tree layer (dbh > 3 30% tree canop cover and a tree stratum, hay production, ponds Riparian with > 60% tree canopy cover and an non-maintained understory. Wetlands to 60% tree anopy cover an pasture, sparsely vegetated nonenuded surface **Buffers** row crops, active maintained open water. If containing both herbaceous and maintained area feed lots, trails, or inches) present, with <30% tree understory present, tree recently seeded other comparable Recent cutover stratum (dbh >3 shrub layers or a and stabilized, or conditions. (dense canopy cover. inches) present, with <30% tree non-maintained other comparable vegetation). understory condition. canopy cover with maintained understory Low Low High High High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums descriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% CI % Riparian Area> 100% Rt Bank CI > 1.50 Left Bank Score > 1.5 Lt Bank CI > 1.50 1.50 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.75 RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

N/A

INSERT PHOTOS:



Looking upstream at stream reach 46-A. The right and left riparian buffers consisted of 100% mature forest cover.

Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC Date SAR# Class length Factor 30544.01 **Martinsville Connector (VDOT)** 03010103 3/5/2019 46-B 106 N/A Henry R6 Name(s) of Evaluator(s) Stream Name and Information Stream Map AW Unnamed Tributary to Matrimony Creek S-46: EB1-7/EC1-7 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Marginal Suboptimal Poor Low Marginal: Non-maintained High Poor: ow Suboptimal ligh Suboptima Riparian areas awns, mowed Riparian areas High Marginal: lense herbaceo and maintained Low Poor: with tree stratum (dbh > 3 inches) vegetation, riparian areas with tree stratum (dbh > 3 inches) areas, nurseries Impervious ense herbaceou no-till cropland; surfaces, mine present, with vegetation with lacking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% actively grazed spoil lands. either a shrub layer or a tree layer (dbh > 3 30% tree canop cover and a tree stratum, hay production, ponds Riparian with > 60% tree canopy cover and an non-maintained understory. Wetlands to 60% tree anopy cover an pasture, sparsely vegetated nonenuded surface **Buffers** row crops, active maintained open water. If containing both herbaceous and shrub layers or a maintained area feed lots, trails, or inches) present, with <30% tree understory present tree recently seeded other comparable Recent cutover stratum (dbh >3 and stabilized, or conditions. (dense canopy cover. inches) present, with <30% tree non-maintained other comparable vegetation). understory condition. canopy cover with maintained understory Low Low High High High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums descriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% CI % Riparian Area> 100% Rt Bank CI > 1.50 Left Bank Score > 1.5 Lt Bank CI > 1.50 1.50 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.75

RCI= (Riparian CI)/2
COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

N/A

INSERT PHOTOS:



Looking upstream at stream reach 46-B. The right and left riparian buffers consisted of 100% mature forest cover.

Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC Date SAR# Class length Factor 30544.01 Martinsville Connector (VDOT) 03010103 3/5/2019 46-C N/A Henry R6 79 Name(s) of Evaluator(s) Stream Name and Information Stream Map Unnamed Tributary to Matrimony Creek S-46: EF1-5/ED1-6 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Marginal Suboptimal Poor Low Marginal: Non-maintained High Poor: ow Suboptimal High Suboptima Riparian areas awns, mowed Riparian areas High Marginal: lense herbaceo and maintained Low Poor: with tree stratum (dbh > 3 inches) vegetation, riparian areas with tree stratum (dbh > 3 inches) areas, nurseries Impervious ense herbaceou no-till cropland; surfaces, mine present, with vegetation with lacking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% actively grazed spoil lands. either a shrub layer or a tree layer (dbh > 3 30% tree canop cover and a tree stratum, hay production, ponds Riparian with > 60% tree canopy cover and an non-maintained understory. Wetlands to 60% tree anopy cover an pasture, sparsely vegetated nonenuded surface **Buffers** row crops, active maintained open water. If containing both herbaceous and shrub layers or a maintained area feed lots, trails, or inches) present, with <30% tree understory present tree recently seeded other comparable Recent cutover stratum (dbh >3 and stabilized, or conditions. (dense canopy cover. inches) present, with <30% tree non-maintained other comparable vegetation). understory condition. canopy cover with maintained understory Low Low High High High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums descriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below. Blocks equal 100 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% CI % Riparian Area> Rt Bank CI > 1.50 Left Bank Score > 1.5 Lt Bank CI > 1.50 1.50 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.75 RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

N/A

INSERT PHOTOS:



Looking upstream at stream reach 46-C. The right and left riparian buffers consisted of 100% mature forest cover.

Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC Date SAR# Class length Factor 30544.01 Martinsville Connector (VDOT) 03010103 3/6/2019 47-A 508 Henry R6 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map Unnamed Tributary to Matrimony Creek S-47: EM1-68 AO 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Marginal Suboptimal Poor Low Marginal: Non-maintained High Poor: ow Suboptimal ligh Suboptima Riparian areas awns, mowed Riparian areas High Marginal: lense herbaceou and maintained Low Poor: with tree stratum (dbh > 3 inches) vegetation, riparian areas with tree stratum (dbh > 3 inches) areas, nurseries Impervious ense herbaceou no-till cropland; surfaces, mine present, with vegetation with lacking shrub and Tree stratum (dbh > 3 inches) present resent, with 30% actively grazed spoil lands. either a shrub layer or a tree layer (dbh > 3 tree stratum, hay production, ponds Riparian 30% tree canon with > 60% tree canopy cover and an non-maintained understory. Wetlands to 60% tree anopy cover an pasture, sparsely vegetated nonenuded surface cover and a **Buffers** row crops, active maintained open water. If containing both herbaceous and maintained area feed lots, trails, or inches) present, with <30% tree understory present, tree recently seeded other comparable Recent cutover stratum (dbh >3 shrub layers or a and stabilized, or conditions. (dense canopy cover. inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover with maintained understory Low Low High High High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums descriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% CI % Riparian Area> Rt Bank CI > 1.50 Left Bank 1.5 Lt Bank CI > 1.50 1.50 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.75

RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 47-A. The right and left riparian buffers are forested with greater than 60% canopy cover.

DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 3/5/2019 48-A 265 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-48: EI1-12/EH1-13 AW **Unnamed Tributary to Matrimony Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 1.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.50

High

Score

1.5

Stream Impact Assessment Form Page 2									
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/5/2019	48-A	265	N/A
. CHANNE vestock	L ALTERATION: Stream cross	ings, riprap, concr			traightening of cha	annel, channeliza	ition, embankmer	nts, spoil piles, constr	ictions,
	Negligible	nor	Conditional Category Moderate			vere	NOTES>>		
				40 - 60% of reach					
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	is disrupted by any of the channel alterations listed in the parameter guidelines. If	is disrupted by any of the channel alterations listed in	by any of the chan in the parameter g 80% of banks sh	of reach is disrupted nel alterations listed juidelines AND/OR ored with gabion, r cement.		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 48-A. The reach had severely eroded, unstable banks. The right and left riparian buffers consisted of 100% mature forest cover. The in-stream habitat was optimal with stable elements in greather than 50% of the reach. There are no known channel alterations.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 3/5/2019 48-B 467 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-48: EH13-33/EJ1-17/EE1 AW **Unnamed Tributary to Matrimony Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 1.60 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

Project # Project Name (Applicant) Locality Cowardin Class. HUC Date SAR # / Data Point length Factor 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 3/5/2019 48-B 467 N/A 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, investock Conditional Category Negligible Minor Moderate Severe	Stream Impact Assessment Form Page 2									
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, investock Conditional Category	Project #	Project Name (App	licant)	Locality		HUC	Date		•	-
Channel Alteration Channelization, dredging, alteration or hardening absent. Stream has naturalized. Channelization nultered pattern or has naturalized. Channelized in the parameter guidelines. Channelized in the parameter guidelin	30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/5/2019	48-B	467	N/A
Channel Alteration Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not part of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not pattern		L ALTERATION: Stream cross	ings, riprap, concr			traightening of cha	annel, channeliza	ation, embankmer		rictions,
Channel Alteration Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Less than 20% of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not		Negligible			erate	NOTES>>				
i iecoveleu. I iecoveleu.	Channel	33			is disrupted by any	is disrupted by any				

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking downstream at stream reach 48-B. The reach was poor with eroded, unstable banks. The right and left riparian buffers consisted of 100% mature forest cover with wetlands present within the right riparian buffer. The in-stream habitat was suboptimal, with stable elements within 30-50% of the reach including various substrate sizes. There are no known channel alterations.

DESCRIBE PROPOSED IMPACT:	DE	SCR	BE I	PRO	POSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 3/6/2019 48-C 245 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-48: EH33-45/EJ17-33 AW **Unnamed Tributary to Matrimony Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 3.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.50

High

Score

1.5

Project # Project Name (Applicant) Locality Cowardin Class. HUC Date SAR # / Data Point length Factor 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 3/6/2019 48-C 245 N/A 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock Conditional Category Negligible Minor Moderate Severe 40 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not pattern has n
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock Conditional Category
Channel Alteration Channelization, dredging, alteration or hardening absent. Stream has an unaltered pattern or has naturalized.
Channel Alteration Channelization, dredging, alteration or hardening absent. Stream has an unaltered pattern or has naturalized. Channelization alterations listed in the parameter guidelines. Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander guidelines. If stream has been channelized, normal stable stream meander guidelines. If stream has been channelized, normal stable stream meander pattern has not pattern
Channel Alteration Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not pattern
recovered. recovered.

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 48-C. The reach had stable banks with bedrock present throughout. The right and left riparian buffers consisted of 100% mature forest cover. The in-stream habitat was optimal and contained leaf packs, shade, woody debris, and various water velocity and depths. There are no known channel alterations.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 3/6/2019 48-D 702 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-48: EH45-98/EJ33-73 AW **Unnamed Tributary to Matrimony Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 1.60 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.50

High

Score

1.5

Stream Impact Assessment Form Page 2									
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	Henry	R3	03010103	3/6/2019	48-D	702	N/A	
4. CHANNEL ivestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of cha	annel, channeliza	ation, embankmer	nts, spoil piles, consti	rictions,
	Negligible	Mir	nor					140123>>	
Channel		Less than 20% of the stream reach	20-40% of the stream reach is	is disrupted by any of the channel alterations listed in the parameter	is disrupted by any of the channel alterations listed in	Greater than 80% of	of reach is disrupted		
Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	is disrupted by any of the channel alterations listed in the parameter guidelines.	of the channel	guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	in the parameter g 80% of banks sh	nel alterations listed guidelines AND/OR lored with gabion, r cement.		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 48-D. The reach had incised, eroded banks. The right and left riparian buffers consisted of 100% mature forest cover with wetlands within the right riparian buffer. The in-stream habitat was optimal with stable elements in greather than 50% of the reach. There are no known channel alterations.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 3/6/2019 48-E 261 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-48: EH98-113/EJ73-107 AW **Unnamed Tributary to Matrimony Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.50

High

Score

1.5

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	Henry	R3	03010103	3/6/2019	48-E	261	N/A	
4. CHANNEl	L ALTERATION: Stream cross	sings, riprap, conci		concrete blocks, s	traightening of ch	annel, channeliza	ation, embankmer	nts, spoil piles, consti	rictions,
	Negligible					Moderate Severe			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter quidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter quidelines.	is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander	Greater than 80% by any of the chan in the parameter 80% of banks sh			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

1.50

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2) COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

0.5

INSERT PHOTOS:

SCORE



Looking upstream at stream reach 48-E. The reach had stable banks with areas of active erosion present. The right and left riparian buffers consisted of 100% mature forest cover. The in-stream habitat was optimal with stable elements in greather than 50% of the reach. There are no known channel alterations.

DESCRIBE	PROPOSED	IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 3/6/2019 48-F 238 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-48: EJ107-144/EO1-14 AO **Unnamed Tributary to Matrimony Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 80% 2% 18% 100% Right Bank Score > 0.6 0.5 1.5 CI= (Sum % RA * Scores*0.01)/2 10% 5% 85% 100% Rt Bank CI > CI % Riparian Area> 0.76 Left Bank 0.85 Lt Bank CI > 1.38 1.07 0.6 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat in greater than 50% of the reach. Cover are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.50

High

Score

1.5

Stream Impact Assessment Form Page 2									
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/6/2019	48-F	238	N/A
4. CHANNE livestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, consti	rictions,
	Negligible M		or Moderate						
	Negligible	IVIII	nor			Sev	ere		
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the channing the parameter of	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 48-F. The reach had eroded banks stabilized by riprap. The right riparian buffer consisted of 80% maintained herbaceous vegetation, 2% impervious surface and 18% mature forest cover. The left buffer consisted of 85% mature forest cover and wetlands, 5% dense shrub and herbaceous vegetation and 10% maintained herbaceous vegetation. The in-stream habitat was optimal and contained various substrate sizes. Channel alterations include riprap, culverts and debris in stream.

DESCRIBE	PROPOSED	IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 3/7/2019 48-G 584 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-48: EO14-53/EJ144-192 AO **Unnamed Tributary to Matrimony Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active lened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 1.60 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 45% 10% 45% 100% Right Bank 0.85 Score > 1.5 0.6 CI= (Sum % RA * Scores*0.01)/2 5% 5% 10% 80% 100% Rt Bank CI > CI % Riparian Area> 1.03 Left Bank 0.5 0.85 Lt Bank CI > 0.67 0.85 1.5 0.6 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes **Conditional Category** NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat in greater than 50% of the reach. Cover are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/7/2019	48-G	584	N/A
. CHANNEI vestock	L ALTERATION: Stream cross	ings, riprap, conci	rete, gabions, or o	concrete blocks, s	traightening of cha	annel, channeliza	tion, embankmen	nts, spoil piles, const	rictions,
			Condition	ol Cotogory				NOTEO	
	Negligible	Mir	Conditiona nor	al Category	erate	Sev	/ere	NOTES>>	
Channel teration	Negligible Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chang in the parameter of	of reach is disrupted nel alterations listed juidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 46-G. The reach had eroded banks with some vegetative protection present. The right riparian buffer consisted of 45% wetland, 10% dense shrubs and 45% maintained field. The left riparian buffer consisted of 5% wetland, 5% impervious surface including gravel lots and 80% maintained lawn. The in-stream habitat was suboptimal with stable elements in 30-50% of the reach. The channel alterations included a culvert.

DESCRIBE PROPOSED IMPACT:	DE	SCR	BE	PRO	POSED	IMPACT
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 48-H 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 3/6/2019 400 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-48: EQ1-41/E053-76 AO **Unnamed Tributary to Matrimony Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 1.60 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 50% 50% 100% Right Bank Score > 1.5 0.6 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.05 Left Bank Lt Bank CI > 1.50 1.28 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/6/2019	48-H	400	N/A
4. CHANNEL livestock	L ALTERATION: Stream cross	ings, riprap, concr	rete, gabions, or o	concrete blocks, s	traightening of cha	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,
			A !''.'	10-1				I	
	No ali albio	NA:		al Category		Con		NOTES>>	
	Negligible	Mir	Conditiona nor	Mod	erate	Se	/ere	NOTES>>	
Channel Alteration	Negligible Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the	Mod 40 - 60% of reach is disrupted by any of the channel	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chan in the parameter of	of reach is disrupted nel alterations listed juidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 48-H. The reach had eroded banks with vegetation present. The right riparian buffer consisted of 50% wetland and 50% maintained field. The left buffer consisted of 100% mature forest cover containing wetlands. The in-stream habitat suboptimal with stable elements in 30-50% of the reach. The channel alterations included a

DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC Data Point Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 3/12/2019 48-I 200 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map AM/SB/MH/AW 6-48: ET1-12/ES1-15/EV1-7/EW1-8 **Unnamed Tributary of Matrimony Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully developed wide bankfull benches Depositional features contribute to stability. The bankfull and low flow egetative protection present on less be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient AND/OR V-shaped channels have than 80% of stream hed is covered by diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 1.60 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceou and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover ar either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 0.6 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 100% 100% Rt Bank CI > CI 0.60 Left Bank 1.5 Lt Bank CI > 1.50 1.05 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. Stream Gradient CI

Scores

1.5

0.9

0.5

High

1.20

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/12/2019	48-I	200	N/A
ivestock	L ALTERATION: Stream cross	ings, riprap, conci		al Category	traigntening of ch	annei, channeliza	tion, embankmer	NOTES>>	rictions,
								INO I LOZZ	
	Negligible	Miı	nor	Mod	erate	Sev	rere	NOTES	
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach	Greater than 80% of by any of the chann	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

0.95

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L_I X IF

INSERT PHOTOS:



Looking upstream at stream reach 48-A. The reach was suboptimal with few areas of active erosion. The right riparian buffer consisted of 85% mature forested area with wetlands and 15% impervious surfaces associated with State Route 220. The left riparian buffer consisted of 70% mature forested areas, 15% impervious surfaces associated with the railroad, and 15% maintained lawns. Instream habitat was present in 30-50% of the reach and consisted of riffles, pools, and leaf packs, however, the reach was degraded by severe aggregation. The reach was channelized through a culvert.

Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC Date SAR# Class length Factor 30544.01 Martinsville Connector (VDOT) 03010103 3/6/2019 49-A Henry R6 76 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map Unnamed Tributary to Matrimony Creek S-49: EJ84-97 AO 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Marginal Suboptimal Poor Low Marginal: Non-maintained High Poor: ow Suboptimal ligh Suboptima Riparian areas awns, mowed Riparian areas High Marginal: lense herbaceou and maintained Low Poor: with tree stratum (dbh > 3 inches) vegetation, riparian areas with tree stratum (dbh > 3 inches) areas, nurseries Impervious ense herbaceou no-till cropland; surfaces, mine present, with vegetation with lacking shrub and Tree stratum (dbh > 3 inches) present resent, with 30% actively grazed spoil lands. either a shrub layer or a tree layer (dbh > 3 tree stratum, hay production, ponds Riparian 30% tree canon with > 60% tree canopy cover and an non-maintained understory. Wetlands to 60% tree anopy cover an pasture, sparsely vegetated nonenuded surface cover and a **Buffers** row crops, active maintained open water. If areas containing both herbaceous and maintained area feed lots, trails, or inches) present, with <30% tree understory present tree recently seeded other comparable Recent cutover stratum (dbh >3 shrub layers or a and stabilized, or conditions. (dense canopy cover. inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover with maintained understory Low Low High High High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums descriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100

IOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

75%

1.5

100%

1.5

25%

1.2

THE REACH CONDITION INDEX (RCI) >>

Rt Bank CI >

Lt Bank CI >

RCI= (Riparian CI)/2

CI= (Sum % RA * Scores*0.01)/2

1.43

1.50

CI

1.47

0.74

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

100%

INSERT PHOTOS:

Right Bank

Left Bank

Score >

% Riparian Area>



REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

Looking upstream at stream reach 49-A. The right riparian buffer consisted of 75% forested with greater than 60% canopy cover, and 25% forested with 30-60% canopy cover that lacked an understory. The left buffer consisted of forest with greater than 60% canopy cover.

DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 3/7/2019 50-A 654 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-50: EP1-45/EJ192-237 AO **Unnamed Tributary to Matrimony Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 10% 90% 100% Right Bank Score > 0.6 1.5 CI= (Sum % RA * Scores*0.01)/2 10% 90% 100% Rt Bank CI > CI % Riparian Area> 1.41 Left Bank Lt Bank CI > 0.69 1.05 1.5 0.6 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/7/2019	50-A	654	N/A
1. CHANNE ivestock	L ALTERATION: Stream cross	ings, riprap, conci			traightening of ch	annel, channeliza	tion, embankmer		ictions,
			Condition	al Category				NOTES>>	
	Negligible	Mir	nor	Mod	erate	Se	/ere	NOTES>>	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chan in the parameter g			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2) COMPENSATION REQUIREMENT (CR) >>

N/A CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 50-A. The reach moderately eroded banks. The right riparian buffer consisted of 10% maintained lawn and 90% forest with >60% canopy cover. The left buffer consisted of 10% forest with >60% canopy cover and 90% maintained lawn. The instream habitat was suboptimal with stable elements in 30-50% of the reach. No channel alteration was present in this reach.

DESCRIBE PROPOSED IMPAC	T:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 3/12/2019 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 51-A 139 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map S-51: FR1-10, FQ1-12 JB/JF/WN Tributary of Matrimony Creek 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 90% 10% 100% Right Bank Score > 0.5 1.5 CI= (Sum % RA * Scores*0.01)/2 75% 25% 100% Rt Bank CI > 0.60 CI % Riparian Area> Left Bank Lt Bank CI > 0.83 0.71 0.6 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/12/2019	51-A	139	N/A
4. CHANNEI ivestock	_ ALTERATION: Stream cross	ings, riprap, concr			traightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, constr	rictions,
			Conditiona	al Category				NOTES>>	
	Negligible	Mir		al Category Mod	erate	Sev	/ere	NOTES>>	

stream meander

pattern has not

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

normal stable stream meander

pattern has not

1.1

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

0.90

CI

1.30

RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

0.5

INSERT PHOTOS:

SCORE

(WSSI Photo Location XXXX)

1.5



Looking southwest (downstream) at Stream Reach 51-A. The reach is often incised, with erosion present on 40-60% of banks. The right bank riparian buffer is composed almost entirely of impervious surfaces (road) and has a small portion of forest with greater than 60% canopy cover. The left buffer is composed largely of maintained grass and has a portion of forest with greater than 60% canopy cover. Habitat elements are lacking and are present in less than 10% of the reach. The upstream end of the reach is fed by a culvert, disrupting less than 20% of the reach.

DESCRIBE	PROPOSED	IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 3/6/2019 52-A 212 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-52: EH113-122/EN1-12 AW **Unnamed Tributary to Matrimony Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 2% 98% 100% Right Bank 0.85 Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 50% 50% 100% Rt Bank CI > CI % Riparian Area> 1.49 Left Bank Lt Bank CI > 1.05 1.27 0.6 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/6/2019	52-A	212	N/A
4. CHANNEI livestock	L ALTERATION: Stream cross	ings, riprap, conci			traightening of cha	annel, channeliza	tion, embankmer		rictions,
	Negligible	Mi	nor	al Category Mod	erate	Sev	/ere	NOTES>>	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	guidelines. If	is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chang in the parameter of	of reach is disrupted nel alterations listed juidelines AND/OR ored with gabion,		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5]	

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 52-A. The reach had incised, eroded banks. The right riparian buffer consisted of 2% non-maintained, dense herbaceous vegetation and 98% forest with greater than 60% canopy cover. The left riparian buffer consisted of 50% forest with greater than 60% canopy cover and 50% maintained lawn. The in-stream habitat was marginal with stable elements in less than 30% of the reach. Channel alterations included a culvert and dumping of debris into the stream.

)	E	SC	R	IBE	PR	ROF	209	SED	IMF	AC.	Γ:

Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia

			For us	e in ephemeral s	treams				
Project #	Project Name	•	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R6	03010103	3/12/2019	52-A	51	N/A
Name	e(s) of Evaluator(s)	Stream Nam	e and Inform	ation				Stream Map	
	M/SR/MH/AW	Unnamed Tr	ibutary to Ma	trimony Cree	le .			S-52: EX1-6/	EV1-6

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

		Con	ditional Cate	gory				NOTES>>		
	Optimal	Subo	ptimal	Mar	ginal	Po	oor			
Riparian Buffers	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an non-maintained understory. Wetlands areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
		High	Low	High	Low	High	Low			
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5			
Delineate ripa descriptors.	urian areas along each stream bank	into Condition C	ategories and Co	ndition Scores usi	ing the	Ensure t	the sums			
Determine sq below.	uare footage for each by measuring	g or estimating ler	ngth and width. C	alculators are pro	vided for you	of % F	Riparian			
3. Enter the % R	tiparian Area and Score for each rip	parian category in	the blocks below			Blocks e	qual 100			
Right Bank	% Riparian Area> 80%	20%					100%			
	Score > 1.2	0.85								
								CI= (Sum % RA * S		
Left Bank	% Riparian Area> 100%						100%	Rt Bank CI >	1.13	CI
	Score > 1.2							Lt Bank CI >	1.20	1.17
	REACH C	ONDITION I	NDEX and S	TREAM COI	NDITION UN	ITS FOR TH	IS REACH			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Riparian CI)/2

0.59

N/A

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 52-A. The right riparian buffer consisted of 80% mature forested area with canopy cover less than 60% and 20% non-maintained vegetation consisting of herbaceous and shrub layers. The left riparian buffer consisted of 100% mature forested area with a canopy cover less than 60%.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 3/6/2019 52-B 193 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-52: EN12-30/EH122-141 AW **Unnamed Tributary to Matrimony Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 1.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 50% 15% 30% 95% Right Bank Score > 0.6 0.5 1.5 CI= (Sum % RA * Scores*0.01)/2 90% 10% 100% Rt Bank CI > CI % Riparian Area> 0.83 Left Bank Lt Bank CI > 0.69 0.76 0.6 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/6/2019	52-B	193	N/A
4. CHANNEI ivestock	L ALTERATION: Stream cross	ings, riprap, conci	rete, gabions, or o		traightening of cha	annel, channeliza	tion, embankmer		ictions,
	Negligible	Mi	nor		erate	Ser	/ere	NOTES>>	
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mod	60 - 80% of reach is disrupted by any of the channel	Greater than 80% of by any of the chan in the parameter g	of reach is disrupted nel alterations listed juidelines AND/OR ored with gabion, r cernent.		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2) COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 52-B. The reach had severely eroded, unstable banks. The right riparian buffer consisted of 55% maintained pasture, 15% impervious surface and 30% wetland. The left riparian buffer consisted of 90% maintained pasture and 10% wetland. The in-stream habitat was poor and lacked stable elements. Channel alterations were severe and included multiple culverts, straightening of channel and impacts from livestock.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 3/12/2019 52-B 108 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map AM/SB/MH/AW S-52: EX6-17/EY6-13 **Unnamed Tributary to Matrimony Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully developed wide bankfull benches Depositional features contribute to stability. The bankfull and low flow egetative protection present on less be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient AND/OR V-shaped channels have than 80% of stream hed is covered by diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 2.00 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceou and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover ar either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 75% 15% 10% 100% Right Bank Score > 1.2 0.5 0.85 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 85% 15% 100% Rt Bank CI > CI 1.06 Left Bank 1.2 0.5 Lt Bank CI > 1.10 1.08 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Stable habitat elements are typically Habitat elements listed above are Available present in 30-50% of the reach and are adequate for maintenance of lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. Stream Gradient CI

Scores

1.5

0.9

0.5

High

0.50

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	нис	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/12/2019	52-B	108	N/A
4. CHANNEI ivestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of cha	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,
	Negligible	Mir	nor		erate	Sev	vere	NOTES>>	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chann	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 0.94

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L_I X IF

INSERT PHOTOS:



Looking upstream at stream reach 52-B. The reach was marginal with areas of active erosion. The right riparian buffer consisted of 75% mature forested area with less than 60% canopy cover, 15% impervious surfaces associated with State Route 220, and 10% densely vegitated herbacious/shub layer. The left riparian buffer consisted of 85% mature forested area and 15% impervious surfaces associated with State Route 220. Instream habitat was present in less then 10% of ther reach. The reach was channelized through a culvert at the bottom of the reach.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 3/6/2019 52-C 112 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-52: EH142-149/EN131-13 AW **Unnamed Tributary to Matrimony Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR naiority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 1.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 5% 15% 85% 105% Right Bank Score > 1.5 0.5 0.6 CI= (Sum % RA * Scores*0.01)/2 30% 30% 40% 100% Rt Bank CI > CI % Riparian Area> 0.66 Left Bank Lt Bank CI > 1.11 0.89 0.6 1.5 1.1 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat in greater than 50% of the reach. Cover are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	olicant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/6/2019	52-C	112	N/A
4. CHANNE ivestock	L ALTERATION: Stream cross	sings, riprap, concr		concrete blocks, s	traightening of ch	annel, channeliza	ation, embankmer	nts, spoil piles, constr	rictions,
	Negligible	Mir			erate	Se	vere	NOTES>>	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in	20-40% of the stream reach is disrupted by any of the channel alterations listed in	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized.	is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized,	in the parameter of 80% of banks sh	of reach is disrupted nel alterations listed guidelines AND/OR nored with gabion, r cement.		
	and the second of the second o	the parameter guidelines.	the parameter guidelines.	normal stable stream meander pattern has not recovered.	normal stable stream meander pattern has not recovered.	пріар, о	. comona		

THE REACH CONDITION INDEX (RCI) >>

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2) N/A

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 52-C. The reach had severely eroded, unstable banks. The right riparian buffer consisted of 5% wetrland, 15% impervious surface and 80% actively grazed, maintained pasture. The left riparian buffer consisted of 40% forest with greater than 60% canopy cover and wetlands, 30% actively grazed, maintained pasture and 30% forest with 30-60% canopy cover. The in-stream habitat was poor and lacked stable elements. Channel alterations were severe and included multiple culverts, straightening of channel and impacts from livestock.

	DESCRIBE	PROPOSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 3/7/2019 52-D 408 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-52: EN50-71/EH163-173 AO **Unnamed Tributary to Matrimony Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 1.60 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 45% 55% 100% Right Bank Score > 1.5 0.6 CI= (Sum % RA * Scores*0.01)/2 20% 80% 100% Rt Bank CI > CI % Riparian Area> 1.01 Left Bank Lt Bank CI > 0.78 0.89 1.5 0.6 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/7/2019	52-D	408	N/A
I. CHANNEL vestock	ALTERATION: Stream cross	ings, riprap, concr			traightening of cha	annel, channeliza	ition, embankmer		rictions,
	Negligible	NA:		al Category	oroto		10.00	NOTES>>	
	Negligible	Mir	Conditiona nor	Mod	erate	Sev	/ere	NOTES>>	
Channel Alteration	Negligible Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is	Mod 40 - 60% of reach is disrupted by any of the channel	is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chann in the parameter g			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 0.70 RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 52-D. The reach was unstable and had been channelized. The right riparian buffer consisted of 45% wetland and forest with greater than 60% canopy cover, and 55% maintained pasture. The left buffer consisted of 20% wetlands and forest with greater than 60% canopy cover, and 80% maintained pasture. The in-stream habitat lacked stable features. The channel had been greatly altered through channelization, culvert installation and livestock access.

)	E	SC	R	IBE	PR	ROF	209	SED	IMF	AC.	Γ:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 3/7/2019 52-E 531 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-52: EH173-206/EN71-111 AO **Unnamed Tributary to Matrimony Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 75% 25% 100% Right Bank Score > 1.5 0.6 CI= (Sum % RA * Scores*0.01)/2 15% 5% 80% 100% Rt Bank CI > CI % Riparian Area> 1.28 Left Bank Lt Bank CI > 0.76 1.02 1.5 1.1 0.6 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	нис	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/7/2019	52-E	531	N/A
4. CHANNE ivestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of ch	annel, channeliza	ation, embankmer	NOTES>>	rictions,
	Negligible	Mir			erate	Ser		NOTES>>	
						-	vere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chan in the parameter g			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 52-E. The reach had eroded banks with moderate vegetative protection. The right riparian buffer consisted of 25% maintained pasture and 75% forest cover with greater than 60% canopy cover and wetlands. The left riparian buffer consisted of 15% wetlands, 80% maintained pasture, and 5% forest with 30-60% canopy cover and a non-maintained understory. The in-stream habitat was marginal and contained stable features in less than 30% of the reach. Channel alterations included livestock access to the stream.

DESCRIBE	PROPOSED	IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 3/7/2019 52-F 223 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-52: EH206-216/EN111-12 JB **Unnamed Tributary to Matrimony Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 1.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 90% 10% 100% Right Bank Score > 1.5 1.1 CI= (Sum % RA * Scores*0.01)/2 55% 15% 70% Rt Bank CI > CI % Riparian Area> 1.46 Left Bank Lt Bank CI > 0.99 1.23 1.5 1.1 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 52-E. The reach had severely incised, eroded banks. The right riparian buffer consisted of 90% forest cover with greater than 60% canopy cover and 10% forest with 30-60% canopy cover and maintained on 30% lotest cover with greater than 60% canopy cover and 10% lotest with 30-60% canopy cover and 45% forest with 30-60% canopy cover and 45% forest with 30-60% canopy cover and maintained understory. The in-stream habitat was suboptimal with stable features throughout 30-50% of the reach. Channel alterations included a culvert.

DESCRIBE	PROPOSED	IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 3/7/2019 53-A 179 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-53: EX1-22/EW1-4/EW30 AW **Unnamed Tributary to Matrimony Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 95% 5% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank 0.5 Lt Bank CI > 1.45 1.5 1.48 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.50

High

Score

1.5

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/7/2019	53-A	179	N/A
4. CHANNE livestock	L ALTERATION: Stream cross	sings, riprap, conc		concrete blocks, s	traightening of cha	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,
	Negligible	Mi	nor		erate	Se	/ere	NOTES	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is	is disrupted by any of the channel alterations listed in the parameter guidelines. If	of the channel alterations listed in	by any of the chan in the parameter of 80% of banks sh		I	

THE REACH CONDITION INDEX (RCI) >>

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2) COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 53-A. The reach had stable banks with some erosion present. The right riparian buffer was forested with greater than 60% canopy cover containing wetlands. The left riparian buffer contained 95% forest with greater than 60% canopy cover and wetlands, and and 5% spoil pile. The in-stream habitat was optimal and contained leaf packs, root wads and various substrate sizes. The channel had no known alterations.

DESCRIBE	PROPOSED	IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 3/7/2019 53-B 115 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-53: EX22-30/EW40-46 AW **Unnamed Tributary to Matrimony Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 1.60 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.50

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/7/2019	53-B	115	N/A
4. CHANNE livestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of cha	annel, channeliza	ition, embankmer	nts, spoil piles, const	rictions,
	Negligible	Mir			erate	Se	/ere	NOTES>>	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	is disrupted by any of the channel alterations listed in the parameter guidelines. If	of the channel	by any of the chan in the parameter of 80% of banks sh	of reach is disrupted nel alterations listed juidelines AND/OR ored with gabion, r cement.		

THE REACH CONDITION INDEX (RCI) >>

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 53-B. The reach had unstable, incised banks. The right and left riparian buffers were forested with greater than 60% canopy cover. The in-stream habitat was optimal with stable elements in greather than 50% of the reach. The channel had no known alterations.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 3/7/2019 53-C 116 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-53: EX30-49/EW4-546 AW **Unnamed Tributary to Matrimony Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 3.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

Stream Impact Assessment Form Page 2										
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor	
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/7/2019	53-C	116	N/A	
4. CHANNE ivestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of ch	annel, channeliza	ation, embankmer	nts, spoil piles, const	rictions,	
	Negligible	Minor		Moderate		Severe		NOTES>>		
Channel Alteration	or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel	60 - 80% of reach	Greater than 80% of by any of the chan in the parameter g	of reach is disrupted nel alterations listed guidelines AND/OR nored with gabion, r cement.			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 53-C. The reach had stable banks with little incision and active erosion. The right and left riparian buffers were forested with greater than 60% canopy cover, with a wetland located within the right riparian buffer. The in-stream habitat was marginal with 10-30% stable habitat elements within the reach. No channel alterations were

DESCRIBE PROPOSED IMPACT:	DE	SCR	ΒE	PRO	POSED	IMPACT
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Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC Date SAR# Class length Factor 30544.01 Martinsville Connector (VDOT) 03010103 3/7/2019 53-D 256 Henry R6 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map AW Unnamed Tributary to Matrimony Creek S-53: EX40-57/EW54-72 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Marginal Suboptimal Poor Low Marginal: Non-maintained High Poor: ow Suboptimal High Suboptima Riparian areas awns, mowed Riparian areas High Marginal: lense herbaceo and maintained Low Poor: with tree stratum (dbh > 3 inches) vegetation, riparian areas with tree stratum (dbh > 3 inches) areas, nurseries Impervious ense herbaceou no-till cropland; surfaces, mine present, with vegetation with lacking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% actively grazed spoil lands. either a shrub layer or a tree layer (dbh > 3 30% tree canop cover and a tree stratum, hay production, ponds Riparian with > 60% tree canopy cover and an non-maintained understory. Wetlands to 60% tree anopy cover an pasture, sparsely vegetated nonnuded surfac **Buffers** row crops, active maintained open water. If containing both herbaceous and maintained area feed lots, trails, or inches) present, with <30% tree understory present tree recently seeded other comparable Recent cutover stratum (dbh >3 shrub layers or a and stabilized, or conditions. (dense canopy cover. inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover with maintained understory Low Low High High High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums descriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 65% % Riparian Area> 15% 20% 100% Rt Bank CI > 1.50 CI Left Bank 0.85 0.5 1.5 Lt Bank CI > 1.20 1.35 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.68 RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

N/A

INSERT PHOTOS:



Looking downstream at stream reach 53-D. The right riparian buffer was forested with greater than 60% canopy cover. The left riparian buffer was of 65% forested with greater than 60% canopy cover, 15% non-maintained dense herbaceous vegetation and 20% impervious surface.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 3/6/2019 54-A 80 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-54: EW3-30 AO **Unnamed Tributary to Matrimony Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

Stream Impact Assessment Form Page 2											
Project #	Project Name (App	olicant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor		
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/6/2019	54-A	80	N/A		
4. CHANNE livestock	L ALTERATION: Stream cross	sings, riprap, concr		concrete blocks, s	traightening of cha	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,		
	Negligible	Mir	nor	<u>_ </u>		Severe		140123>>			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is	is disrupted by any of the channel alterations listed in the parameter guidelines. If	of the channel alterations listed in	by any of the chan in the parameter of 80% of banks sh	of reach is disrupted nel alterations listed juidelines AND/OR ored with gabion, r cement.	I			

THE REACH CONDITION INDEX (RCI) >>

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 54-A. The reach had stable banks with little erosion present. The right and left riparian buffers consisted of 100% forest cover with greater than 60% canopy cover containing wetlands. The in-stream habitat was suboptimal and contained leaf packs and woody debris. The channel had no known alterations.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 3/7/2019 55-A 185 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-55: EY1-22/EZ1-19 AW **Unnamed Tributary to Matrimony Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 1.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 50% 50% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.05 1.28 1.5 0.6 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

Stream Impact Assessment Form Page 2											
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor		
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/7/2019	55-A	185	N/A		
4. CHANNE livestock	L ALTERATION: Stream cross	sings, riprap, conc		concrete blocks, s	traightening of cha	annel, channeliza	tion, embankmer	NOTES>>	rictions,		
	Negligible	Mi	<u>_ </u>		Severe		NOTES				
				40 - 60% of reach is disrupted by any							
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	stream reach is	the parameter guidelines. If		by any of the chang in the parameter g 80% of banks sh					

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 55-A. The reach had overwidened with incised, unstable banks. The right riparian buffer was forested with greater than 60% canopy cover. The left riparian buffer was 50% forested with greater than 60% canopy cover and 50% maintained lawn. The in-stream habitat was suboptimal, with stable elements in 30-50% of the reach. The channel had no known alterations.

DESCRIBE PROPOSED IMPACT:	DE	SCR	ΒE	PRO	POSED	IMPACT
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Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC Date SAR# Class length Factor 30544.01 Martinsville Connector (VDOT) 03010103 3/7/2019 55-B 172 Henry R6 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map Unnamed Tributary to Matrimony Creek S-55: EY22-43/EZ19-35 AW 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Marginal Suboptimal Poor Low Marginal: Non-maintained High Poor: ow Suboptimal ligh Suboptima Riparian areas awns, mowed Riparian areas High Marginal: lense herbaceou and maintained Low Poor: with tree stratum (dbh > 3 inches) vegetation, riparian areas with tree stratum (dbh > 3 inches) areas, nurseries Impervious ense herbaceou no-till cropland; surfaces, mine present, with vegetation with lacking shrub and Tree stratum (dbh > 3 inches) present resent, with 30% actively grazed spoil lands. either a shrub layer or a tree layer (dbh > 3 30% tree canop cover and a tree stratum, hay production, ponds Riparian with > 60% tree canopy cover and an non-maintained understory. Wetlands to 60% tree anopy cover an pasture, sparsely vegetated nonenuded surface **Buffers** row crops, active maintained open water. If areas containing both herbaceous and maintained area feed lots, trails, or inches) present, with <30% tree understory present, tree recently seeded other comparable Recent cutover stratum (dbh >3 shrub layers or a and stabilized, or conditions. (dense canopy cover. inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained understory Low Low High High High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums descriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 CI % Riparian Area> 40% 60% 100% Rt Bank CI > 1.50 Left Bank Score > 1.5 0.6 Lt Bank CI > 0.96 1.23 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.62 RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

N/A

INSERT PHOTOS:



Looking upstream at stream reach 55-B. The right riparian buffer was forested with greater than 60% canopy cover. The left riparian buffer was 40% forested with greater than 60% canopy cover, and 60% mowed lawn.

Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC Date SAR# Class length Factor 30544.01 **Martinsville Connector (VDOT)** 03010103 3/7/2019 55-C 335 Henry R6 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map Unnamed Tributary to Matrimony Creek S-55: EZ48-67/EY52-76 AO 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Marginal Suboptimal Poor Low Marginal: Non-maintained High Poor: ow Suboptimal ligh Suboptima Riparian areas awns, mowed Riparian areas High Marginal: lense herbaceo and maintained Low Poor: with tree stratum (dbh > 3 inches) vegetation, riparian areas with tree stratum (dbh > 3 inches) areas, nurseries Impervious ense herbaceou no-till cropland; surfaces, mine present, with vegetation with lacking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% actively grazed spoil lands. either a shrub layer or a tree layer (dbh > 3 30% tree canop cover and a tree stratum, hay production, ponds Riparian with > 60% tree canopy cover and an non-maintained understory. Wetlands to 60% tree anopy cover an pasture, sparsely vegetated nonnuded surfac **Buffers** row crops, active maintained open water. If containing both herbaceous and maintained area feed lots, trails, or inches) present, with <30% tree understory present, tree recently seeded other comparable Recent cutover stratum (dbh >3 shrub layers or a and stabilized, or conditions. (dense canopy cover. inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover with maintained understory Low Low High High High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums descriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 50% CI % Riparian Area> 50% 100% Rt Bank CI > 1.50 Left Bank Score > 1.5 0.6 Lt Bank CI > 1.05 1.28 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.64 RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

N/A

INSERT PHOTOS:



Looking upstream at stream reach 55-C. The right riparian buffer was forested with greater than 60% canopy cover. The left riparian buffer was 50% orested with greater than 60% canopy cover and 50% maintained lawn.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 3/8/2019 56-A 331 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-56: FA1-23/FB1-21/FC1-AO **Unnamed Tributary to Matrimony Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

Stream Impact Assessment Form Page 2										
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor	
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/8/2019	56-A	331	N/A	
4. CHANNEL livestock	L ALTERATION: Stream cross	ings, riprap, conci		concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,	
	Negligible	nor Moderate			Severe		NOTEGOO			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	is disrupted by any of the channel alterations listed in the parameter guidelines. If	of the channel alterations listed in	by any of the chani in the parameter g	nel alterations listed uidelines AND/OR ored with gabion,	ı		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 56-A. The reach had stable banks with little incision. The right and left riparian buffers were forested with greater than 60% canopy cover, with wetlands located within the left riparian buffer. The in-stream habitat was suboptimal with stable elements found within 30-50% of the reach. No channel alterations in reach.

DESCRIBE PROPOSED IMPACT:	DE	SCR	ΒE	PRO	POSED	IMPACT
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 3/8/2019 56-B 85 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-56: FA23-32/FC4-13 AO **Unnamed Tributary to Matrimony Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 1.60 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 5% 95% 100% Right Bank Score > 0.6 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.46 Left Bank Lt Bank CI > 1.50 1.48 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.50

High

Score

1.5

Stream Impact Assessment Form Page 2										
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor	
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/8/2019	56-B	85	N/A	
. CHANNEI	L ALTERATION: Stream cross	ings, riprap, concr	rete, gabions, or o	concrete blocks, s	traightening of cha	annel, channeliza	tion, embankmer	nts, spoil piles, constr	rictions,	
			Conditiona	al Category				NOTES		
	Negligible	Mir	Conditiona nor	al Category Mod	erate	Sev	/ere	NOTES>>		
Channel Alteration	Negligible Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mod 40 - 60% of reach is disrupted by any of the channel	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chang in the parameter of	of reach is disrupted nel alterations listed juidelines AND/OR ored with gabion,			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2) COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 56-B. The reach had incised, unstable banks. The right riparian buffer was 80% forested with greater than 60% canopy cover and 5% maintained herbaceous vegetation. The left riparian buffer was forested with greater than 60% canopy cover. The in-stream habitat was optimal and contained Istable elements in greater than 50% of the reach. The channel had no known alterations.

DESCRIBE PROPOSED IMPACT:

Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact SAR # Project # **Project Name** Locality HUC Date Class. length **Factor** 30544.01 **Martinsville Connector (VDOT)** R6 03010103 3/8/2019 56-C 58 N/A Henry

Name(s) of Evaluator(s) Stream Name and Information Stream Map AW Unnamed Tributary to Matrimony Creek S-56: FA32-34/FC13-15

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

Riparian Buffers Tree stratum (dbh > 3 inches) present, with 50% tree canopy cover and an eas. with receiver and areas. Tree stratum (dbh > 3 inches) present, with 30% tree canopy cover and an on-maintained understory. High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 20% tree canopy cover and an on-maintained understory. High Marginal: Non-maintained, dense herbaceous vegetation with cover and a maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with 30% tree canopy cover and an shrub layers or a non-maintained understory. Recent cutover (dense vegetation). High Low O.55 Condition Scores			Con	ditional Cate	gory			
Riparian Buffers Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an non-maintained understory. Wetlands areas. Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an non-maintained understory. Wetlands areas. High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% tree canopy cover and an containing both herbaceous and shrub layers or a non-maintained understory. High Low High Low High Low High Low Condition Low Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% tree canopy cover and an containing both herbaceous and shrub layers or a non-maintained understory. High Low High Low High Low High Low High Low Condition		Optimal	Subo	ptimal	Mar	ginal	Poor	
High Low High Low High Low Condition 15 12 11 0.85 0.75 0.6 0.5	•	with > 60% tree canopy cover and an non-maintained understory. Wetlands	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable
15 17 11 085 075 06 05			High	Low	High	Low	High	Low
		1.5	1.2	1.1	0.85	0.75	0.6	0.5

1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the

2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you

3. Enter the % Riparian Area and Score for each riparian category in the blocks below.

Blocks equal 100 20% 80% 100% Right Bank Score > 0.85 1.5

100% % Riparian Area> Left Bank

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

1.5

THE REACH CONDITION INDEX (RCI) >> RCI= (Riparian CI)/2

Rt Bank CI >

Lt Bank CI >

NOTES>>

COMPENSATION REQUIREMENT (CR) >> N/A

CI= (Sum % RA * Scores*0.01)/2

1.37

1.50

CI

1.44

0.72

CR = RCI X LF X IF

Ensure the sums

of % Riparian

INSERT PHOTOS:



Looking upstream at stream reach 56-C. The right riparian buffer was forested with greater than 60% canopy cover. The left riparian buffer was 65% forested with greater than 60% canopy cover, and 20% non-maintained, dense herbaceous vegetation with a shrub layer present.

Unified Stream Methodology for use in Virginia

		roi us	e in epnemerai s	treams				
Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor
30544.01	Martinsville Connector (VDOT)	Henry	R6	03010103	3/8/2019	56-D	641	N/A

Name(s) of Evaluator(s)

Stream Name and Information

Stream Map

Unnamed Tributary to Matrimony Creek

S-56: FC21-28/FA40-45

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

		Con	iditional Cate	gory			
	Optimal	Subo	ptimal	Mar	ginal	Po	or
Riparian Buffers	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an non-maintained understory. Wetlands areas.	to 60% tree	with tree stratum (dbh > 3 inches) present, with >30% tree canopy	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition	Low Poor: Impervious surfaces, mine spoil lands, denuded surface row crops, activ feed lots, trails, other comparabl conditions.
		High	Low	High	Low	High	Low
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5

 Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.

descriptors.

2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.

3. Enter the % Riparian Area and Score for each riparian category in the blocks below

3. Litter the 70 K	apanan Area anu	Score for each in	danan calegory in	the blocks below.		DIOCKS 6	quai 100
Right Bank	% Riparian Area>	10%	90%				100%
Kigiit Balik	Score >	0.6	1.5				

Score > 0.6 1.5 100% 100%

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

1.5

THE REACH CONDITION INDEX (RCI) >>

RCI= (Riparian CI)/2

Rt Bank CI >

Lt Bank CI >

CI= (Sum % RA * Scores*0.01)/2

1.41

1.50

CI

1.46

0.73

COMPENSATION REQUIREMENT (CR) >> N/A

NOTES>>

CR = RCI X LF X IF

Ensure the sums

of % Riparian

INSERT PHOTOS:

Left Bank



Looking upstream at stream reach 56-D. The right riparian buffer was 90% forested with greater than 60% canopy cover and 10% herbaceous vegetation. The left riparian buffer was forested with greater than 60% canopy cover.

Unified Stream Methodology for use in Virginia

		For us	e in epnemerai s	treams				
Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor
30544.01	Martinsville Connector (VDOT)	Henry	R6	03010103	3/8/2019	56-E	113	N/A
Name	(a) of Evaluator(a) Ctroom Nom	a and Inform	ati an				Ctus sus Man	

Name(s) of Evaluator(s) Stream Name and Information Unnamed Tributary to Matrimony Creek S-56: FC43-52/FA64-73 AW

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

		Con	ditional Cate	gory			
	Optimal	Subo	ptimal	Mar	ginal	Po	oor
Riparian Buffers	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an non-maintained understory. Wetlands areas.	to 60% tree	with tree stratum (dbh > 3 inches) present, with >30% tree canopy	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surface row crops, active feed lots, trails, o other comparable conditions.
		High	Low	High	Low	High	Low
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5

Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the

descriptors. 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you

1.5

3. Enter the % Riparian Area and Score for each riparian category in the blocks below.

	•				<u>'</u>
Right Bank	% Riparian Area>	100%			100%
Kigiit Balik	Score >	1.5			

50% 50% 100% % Riparian Area> Left Bank

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

0.85

THE REACH CONDITION INDEX (RCI) >> RCI= (Riparian CI)/2

NOTES>>

COMPENSATION REQUIREMENT (CR) >>

CI= (Sum % RA * Scores*0.01)/2

1.50

1.18

Rt Bank CI >

Lt Bank CI >

CI

1.34

0.67

N/A

CR = RCI X LF X IF

Ensure the sums

of % Riparian

Blocks equal 100

INSERT PHOTOS:



 $Looking\ upstream\ at\ stream\ reach\ 56-E.\ The\ right\ riparian\ buffer\ was\ forested\ with\ greater\ than\ 60\%\ canopy\ cover.\ The$ left buffer was 50% forested with greater than 60% canopy cover, and had 50% cover of non-maintained, dense herbaceous vegetation with a shrub layer.

DESCRIBE PROPOSED IMPACT:

Unified Stream Methodology for use in Virginia

		For us	e in ephemeral s	treams				
Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor
30544.01	Martinsville Connector (VDOT)	Henry	R6	03010103	3/8/2019	57-A	88	N/A
Name	(c) of Evaluator(c) Stroam Nam	and Inform	ation	·	·		Stroom Mon	

Unnamed Tributary to Matrimony Creek S-57: FB21-29/FB33-38 AW

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

		Con	ditional Cate	gory			
	Optimal	Subo	ptimal	Mar	ginal	Po	oor
Riparian Buffers	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an non-maintained understory. Wetlands areas.	to 60% tree	with tree stratum (dbh > 3 inches) present, with >30% tree canopy	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surface row crops, active feed lots, trails, o other comparable conditions.
		High	Low	High	Low	High	Low
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5

Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the

descriptors. 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you

3. Enter the % Riparian Area and Score for each riparian category in the blocks below. 100%

Right Bank	% Riparian Area>	100%		
Right Bank	Score >	1.5		
Left Bank	% Riparian Area>	30%	70%	
Leit Dalik				

% Riparian Area>

Score >

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

1.5

Ensure the sums of % Riparian

Blocks equal 100

100%

100%

		Lt Bank CI >	1.22
TIL	O DE AOU		

Rt Bank CI >

CI= (Sum % RA * Scores*0.01)/2

1.50

CI

1.36

0.68

N/A

NOTES>>

THE REACH CONDITION INDEX (RCI) >> RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 57-A. The right riparian buffer consisted of 100% mature forest cover. The left buffer consisted of 40% mature trees, 60% dense herbaceous and shrub layer. The right riparian buffer was forested with greater than 60% canopy cover. The left buffer was 30% forested with greater than 60% canopy cover, and had 70% cover of tree stratum with 30-60% canopy cover and a maintained understory.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 3/11/2019 58-A 96 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JB/JF/WN Tributary of Marrowbone Creek S-58: FF1-11 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 3.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 30% 70% 100% Right Bank Score > 1.5 0.5 CI= (Sum % RA * Scores*0.01)/2 50% 50% 100% Rt Bank CI > 0.80 CI % Riparian Area> Left Bank Lt Bank CI > 1.05 0.93 1.5 0.6 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/11/2019	58-A	96	N/A
4. CHANNE ivestock	L ALTERATION: Stream cross	ings, riprap, conci		concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, consti	rictions,
	Negligible	Mi	nor		erate	Sev	roro.	NOTES>>	
		1					/ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	is disrupted by any of the channel alterations listed in the parameter guidelines. If	of the channel alterations listed in	Greater than 80% of by any of the chang in the parameter g	of reach is disrupted		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location XXXX)



Looking south (downstream) at Stream Reach 58-A. The stream exhibits very little incision with 80-100% stable banks. The right bank's riparian buffer is encroached upon by impervious road surfaces but is also partly forested (>60% canopy cover). The left bank's riparian buffer is composed of maintained grass associated with the existing overhead electric easement, as well as, forest providing greater than 60% canopy cover. Instream habitat elements are present in 30-50% of the stream. The upstream end of the reach is fed by a culvert, disrupting less than 20% of the reach.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 3/11/2019 58-B 79 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JB/JF/WN Tributary of Matrimony Creek S-58: FF11-18 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 3.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 0.6 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > 0.60 CI % Riparian Area> Left Bank Lt Bank CI > 0.60 0.60 0.6 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	olicant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/11/2019	58-B	79	N/A
4. CHANNEL livestock	ALTERATION: Stream cross	sings, riprap, concr			traightening of ch	annel, channeliza	ation, embankmer	nts, spoil piles, constr	ictions,
			Condition	al Category				NOTES>>	
	Negligible	Mir	nor		erate	Sev	vere		
	· · · · · · · · · · · · · · · · · · ·			40 - 60% of reach					

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

1.50

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

0.5

INSERT PHOTOS:

SCORE

(WSSI Photo Location XXXX)

1.5



Looking southeast (downstream) at Stream Reach 58-B. The stream exhibits very little incision with 80-100% stable banks. The right and left banks' riparian buffers are composed of maintained grass associated with the existing overhead electric easement. Instream habitat elements are present in 30-50% of the stream. The channel had no known alterations.

DESCRIBE PROPOSED IMPACT:	DE	SCR	BE I	PRO	POSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 3/11/2019 58-C 1,248 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JB/JF/WN Tributary of Matrimony Creek S-58: FF18-75 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	r (VDOT)	Henry	R3	03010103	3/11/2019	58-C	1,248	N/A
4. CHANNEL livestock	_ ALTERATION: Stream crossi	ngs, riprap, conci	rete, gabions, or o	concrete blocks, s	traightening of ch	annel, channeliza	ition, embankmer	nts, spoil piles, const	rictions,
			Condition	al Category				NOTES>>	
	Negligible	Mir	nor	Mod	erate	Sev	/ere		
				40 - 60% of reach	60 - 80% of reach				

s disrupted by any of the channel s disrupted by any of the channel Less than 20% of 20-40% of the terations listed in the parameter guidelines. If terations listed i Greater than 80% of reach is disrupted by any of the channel alterations lister in the parameter guidelines AND/OR Channel the stream reach s disrupted by an stream reach is disrupted by any the parameter guidelines. If Channelization, dredging, alteration, or hardening absent. Stream has an Alteration of the channel of the channel tream has beer stream has beer alterations listed in the parameter guidelines. 80% of banks shored with gabion, riprap, or cement. unaltered pattern or has naturalized. Iterations listed i channelized, normal stable channelized, normal stable the parameter guidelines. stream meande stream meander pattern has not pattern has not recovere **SCORE** 1.5 1.3 1.1 0.9 0.7 0.5

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.32 RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

CI

1.50

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location XXXX)



Looking southeast (downstream) at Stream Reach 58-C. The stream exhibits very little incision with 60-80% stable banks. The right and left banks' riparian buffers are composed of greater than 60% tree canopy cover. Instream habitat elements are present in 30-50% of the stream. The channel had no known alterations.

DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 3/11/2019 59-A 150 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map S-59: FH48-53, FG48-54 JB/JF/WN Tributary of Matrimony Creek 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.2 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.20 Left Bank Lt Bank CI > 1.20 1.20 1.2 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	olicant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/11/2019	59-A	150	N/A
4. CHANNEI ivestock	L ALTERATION: Stream cross	sings, riprap, concr			traightening of cha	annel, channeliza	ition, embankmer		ictions,
	Negligible	Mi	nor	al Category	erate	Sou	/ere	NOTES>>	
	Negligible	IVIII	1101	IVIOU	erate	361			
				40 - 60% of reach	60 - 80% of reach		reie		
Channel Alteration	or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	140 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	of the channel alterations listed in	Greater than 80% of by any of the chang in the parameter g	of reach is disrupted		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location XXXX)



Looking north (upstream) at Stream Reach 59-A. The reach is slightly incised, but the majority of the banks are stable (60-80%). The right and left riparian buffers are composed of tree canopy cover between 30-60% and a non-maintained understory. Stable habitat elements are present in 10-30% of the reach. The upstream end of the reach is fed by a culvert, disrupting less than 20% of the reach.

DESCRIBE PROPOSED IMPACT:	DE	SCR	BE I	PRO	POSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 3/11/2019 59-B 164 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map S-59: FH38-48 JB/JF/WN Tributary of Matrimony Creek 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 0.6 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > 0.60 CI % Riparian Area> Left Bank Lt Bank CI > 0.60 0.60 0.6 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	ream Ir	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	r (VDOT)	Henry	R4	03010103	3/11/2019	59-B	164	N/A
4. CHANNEL livestock	_ ALTERATION: Stream cross	ings, riprap, conc		concrete blocks, s	straightening of ch	annel, channeliza		nts, spoil piles, constr	ictions,
	Negligible	Mi	nor		erate	Sev	/ere	NOTES	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is	is disrupted by any of the channel	is disrupted by any of the channel	Greater than 80% of by any of the chang in the parameter g 80% of banks sh	of reach is disrupted nel alterations listed juidelines AND/OR ored with gabion, r cement.		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

1.50

RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

0.5

INSERT PHOTOS:

SCORE

(WSSI Photo Location XXXX)



Looking northwest (upstream) at Stream Reach 59-B. The reach is slightly incised, but the majority of the banks are stable (60-80%). The right and left riparian buffers consist of a herbaceous, maintained right-of-way. Stable habitat elements are present in 10-30% of the reach. The upstream end of the reach is fed by a culvert, disrupting less than 20% of the reach.

DESCRIBE PROPOSED IMPACT:	DE	SCR	BE I	PRO	POSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 3/11/2019 59-C 733 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map S-59: FH1-38 JB/JF/WN Tributary of Matrimony Creek 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/11/2019	59-C	733	N/A
1. CHANNEI ivestock	_ ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of ch	annel, channeliza		ts, spoil piles, constr	rictions,
	Negligible	Mir	nor	Mod	erate	Sev	ere		
		Less than 20% of	20-40% of the	40 - 60% of reach is disrupted by any of the channel	60 - 80% of reach is disrupted by any of the channel				

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

N/A

1.50

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

0.5

INSERT PHOTOS:

SCORE

(WSSI Photo Location XXXX)



Looking upstream at Stream Reach 59-C. The reach is slightly incised, but the majority of the banks are stable (60-80%). The right and left riparian buffers are composed of tree stratum with greater than 60% tree canopy cover. Stable habitat elements are present in 30-50% of the reach. No channel alteration is present within the reach.

DESCRIBE PROPOSED IMPACT:

Unified Stream Methodology for use in Virginia

			For us	e in epnemerai s	treams				
Project #	Project Name	е	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor
30544.01	Martinsville Conn	ector	Henry	R4	3010103	2/27/2019	60-A	53	N/A
Name	e(s) of Evaluator(s)	Stream Name	e and Informa	ation				Stream Man	

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Canditional Catagony

Ephemeral Tributary to Marrowbone Creek

		Con	ditional Cate	gory			
	Optimal	Subo	ptimal	Mar	ginal	Po	oor
Riparian Buffers	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an non-maintained understory. Wetlands areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.
		High	Low	High	Low	High	Low
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5
	•						

Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the

descriptors. 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you

0.6

ΑO

3. Enter the % R	iparian Area and	Score for each rip	parian category in	the blocks below	·.	Blocks e	qual 100
Right Bank	% Riparian Area>	100%					1009
Kigiit Balik	Score >	1.5					

50% 50% 100% % Riparian Area> Left Bank

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

1.5

THE REACH CONDITION INDEX (RCI) >> RCI= (Riparian CI)/2

Rt Bank CI >

Lt Bank CI >

CI= (Sum % RA * Scores*0.01)/2

1.50

1.05

CI

1.28

0.64

S-60: A1-16/B1-13

NOTES>>

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

Ensure the sums

of % Riparian

100%

INSERT PHOTOS:

Score >



Looking upstream at stream reach 60-A. The right riparian buffer consisted of 100% mature forest cover, and the left riparian buffer consisted of 50% mature forest cover and 50% field containing herbaceous vegetation.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 3/11/2019 61-A 424 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map JB/JF/WN **Unnamed Tributary to Marrowbone Creek** Exhibit #, Sheet # of # 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. 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Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 90% 10% 100% Right Bank Score > 0.5 1.2 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 0.57 Left Bank Lt Bank CI > 1.50 1.04 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/11/2019	61-A	424	N/A
4. CHANNEI livestock	L ALTERATION: Stream cross	ings, riprap, concr	rete, gabions, or o		traightening of cha	annel, channeliza	tion, embankmer	nts, spoil piles, constr	rictions,
	Negligible	Miı	nor		erate	Sev	/ere	NOTES>>	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chanr in the parameter g	nel alterations listed juidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking southwest (downstream) at Stream Reach 60-C. The reach is often incised with erosion present on 40-60% of banks. The left bank riparian buffer is heavily encroached upon by impervious surfaces (road) and has some forested areas with 30-60% canopy cover; the right bank riparian buffer is entirely forested and exhibits greater than 60% canopy cover. Habitat elements are unstable and are present in less than 10% of the reach. The reach has been significantly altered (60-80%) by the presence of a culvert at bottom of stream.

DESCRIBE	PROPOSED	IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 3/11/2019 61-B 104 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map S-61: FL12-15 JB/JF/WN Tributary of Matrimony Creek 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. 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RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

Stream Impact Assessment Form Page 2									
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/11/2019	61-B	104	N/A
4. CHANNEI	L ALTERATION: Stream cross	ings, riprap, concr	rete, gabions, or o	concrete blocks, s	traightening of cha	annel, channeliza	tion, embankmer	nts, spoil piles, constr	ictions,
								1	
				al Category				NOTES>>	
	Negligible	Miı	Conditiona nor	Mode	erate	Sev	vere	NOTES>>	
Channel Alteration	Negligible Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the	Mode 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in		of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location XXXX)



Looking south (downstream) at Stream Reach 61-B. The reach is slightly incised, with few areas showing signs of active erosion. The right and left riparian buffers consists of greater than 60% tree canopy cover. Stable habitat elements are present in 30-50% of the reach. The reach shows no signs of alteration.

DESCRIBE PROPOSED IMPAC	T:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 3/11/2019 61-C 76 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map S-61: FL15-16, FK20-28 JB/JF/WN Tributary of Matrimony Creek 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 90% 10% 100% Right Bank Score > 0.5 1.2 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 0.57 Left Bank Lt Bank CI > 1.50 1.04 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

Stream Impact Assessment Form Page 2									
Project #	Project Name (App	licant)	Locality	Cowardin Class.	нис	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/11/2019	61-C	76	N/A
4. CHANNE livestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer	NOTES>>	rictions,
	Negligible	Mir			erate	Sev	/ere	NOTES>>	
				40 - 60% of reach					
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	is disrupted by any of the channel alterations listed in the parameter guidelines. If	of the channel alterations listed in	in the parameter g	nei aiterations listed juidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2) COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location XXXX)



Looking southwest (downstream) at Stream Reach 61-C. The reach is often incised with erosion present on 40-60% of banks. The left bank riparian buffer is heavily encroached upon by impervious surfaces (road) and has some forested areas with 30-60% canopy cover. The right bank riparian buffer is entirely forested and exhibits greater than 60% canopy cover. Habitat elements are unstable and are present in less than 10% of the reach. The reach has been significantly altered (60-80%) by the presence of a culvert and the adjacent road.

)	E	SC	R	IBE	PR	ROF	209	SED	IMF	AC.	Γ:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 3/11/2019 62-A 92 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JB/JF/WN Tributary of Matrimony Creek S-62: FM9-15, FN7-11 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 90% 10% 100% Right Bank Score > 1.5 0.6 CI= (Sum % RA * Scores*0.01)/2 90% 10% 100% Rt Bank CI > CI % Riparian Area> 1.41 Left Bank 0.6 Lt Bank CI > 1.41 1.5 1.41 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/11/2019	62-A	92	N/A
4. CHANNEI livestock	L ALTERATION: Stream cross	ings, riprap, conci	rete, gabions, or o	concrete blocks, s	traightening of cha	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,
	No of other			al Category		0		NOTES>>	
	Negligible	Min	Conditiona nor	Mod	erate	Sev	vere	NOTES>>	
Channel Alteration	Negligible Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	nor	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	is disrupted by any of the channel alterations listed in		of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

1.20

RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2) COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location XXXX)



Looking south (upstream) at Stream Reach 62-A. The reach is slightly incised, but the majority of the banks are stable (60-80%). The right and left riparian buffers are composed largely of forest canopy cover greater than 60%, with a small area on both banks composed of maintained grass. Stable habitat elements are present in 10-30% of the reach. The upstream end of the reach is fed by a culvert, disrupting less than 20% of the reach.

DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 03/10/2019 63-A 227 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map S-63: BJ3-16, BK2-19 JF/JB/WN Tributary of Little Marrowbone Creek 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 90% 10% 100% Right Bank 0.85 Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.44 Left Bank Lt Bank CI > 1.50 1.5 1.47 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

30544.01 Martinsville Connector (VDOT) Henry R4 03010103 03/10/2019 63-A 227 N/A CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions,	Stream Impact Assessment Form Page 2									
Channel Alteration Channel Bornel Channel Cha	Project #	Project Name (App	licant)	Locality		HUC	Date		-	-
Channel Alteration Channel an unaltered pattern or has naturalized. Channel balterations listed in the parameter guidelines. Channel and the parameter guidelines. Channel balterations listed in the parameter guidelines. Severe 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channel balterations listed in the parameter guidelines. If stream has been channel balterations listed in the parameter guidelines. If stream has been channel balterations listed in the parameter guidelines. If stream meander pattern has not pattern has	30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	03/10/2019	63-A	227	N/A
Channel Alteration Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Channelization absent. Stream has an unaltered pattern or has naturalized. Channelization, dredging, alteration, isted in the parameter guidelines. If the parameter guidelines and the parameter guidelines. If the parameter guidelines are the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not patt	. CHANNEI vestock	L ALTERATION: Stream cross	ings, riprap, concr	rete, gabions, or o	concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, constr	ictions,
Channel Alteration Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Channelization absent. Stream has an unaltered pattern or has naturalized. Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Less than 20% of the channel stream reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander guidelines. If stream has been channelized, normal stable stream meander pattern has not pattern has				A 1141	1.4					
Channel Alteration Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not stream meander pattern has not pattern has not stream meander pattern has not pattern has not stream meander pattern has not stream has been channelized, normal stable stream has bee		Magligible	M:			orata.	Cou	10.00	NOTES>>	
		Negligible	Mir		Mod		Sev	rere	NOTES>>	

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\9999.01\Images\Stream Assessment\IMG_2733.jpg)



Looking southwest (downstream) at Stream Reach 63-A. The banks are slightly incised with mostly stable banks (60-80%). The right bank's riparian buffer is predominantly forested, with an area of dense herbaceous vegetation and shrubs providing less than 30% tree canopy cover. The left bank's riparian buffer is composed of forest with greater than 60% tree canopy cover. Instream habitat elements are stable and present in 30-50% of the reach. The downstream end of the reach is culverted, disrupting 20-40% of the reach.

DESCRIBE PROPOSED IMPAC	T:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 03/10/2019 63-B 170 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map S-63: BF1-9, BG1-12 JF/JB/WN Tributary of Little Marrowbone Creek 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 1.60 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 60% 40% 100% Right Bank Score > 1.5 0.5 CI= (Sum % RA * Scores*0.01)/2 60% 40% 100% Rt Bank CI > CI % Riparian Area> 1.10 Left Bank Lt Bank CI > 1.10 1.10 1.5 0.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	Henry	R3	03010103	03/10/2019	63-B	170	N/A	
	L ALTERATION: Stream cross	ings, riprap, concr	rete, gabions, or o	concrete blocks, st	traightening of ch	annel, channeliza	tion embankmer	nts spoil piles constr	rictions
ivestock			Conditiona			,	acti, citizariano.		iotiono,
ivestock	Negligible	Mir	Conditiona	al Category	erate		/ere	NOTES>>	1000110,

pattern has not

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

stream meander

pattern has not

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

1.5

THE REACH CONDITION INDEX (RCI) >>

0.94

CI

1.10

RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

0.5

INSERT PHOTOS:

SCORE

(WSSI Photo Location L:\9999.01\Images\Stream Assessment\IMG_2733.jpg)

1.3

1.1



Looking southwest (downstream) at Stream Reach 63-B. The majority of the banks are incised and overwidened (60-80%). The left and right riparian buffers are occupied by forest with greater than 60% tree canopy cover and an impervious road. Instream habitat elements are present in 10-30% of the reach. Both the downstream and upstream ends of the reach are culverted, disrupting 20-40% of the reach.

DESCRIBE	PROPOSED	IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 03/08/2019 63-C 127 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JF/JB/WN Tributary of Little Marrowbone Creek S-63: AR1-9, AQ1-9 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 80% 20% 100% Right Bank Score > 1.5 0.75 CI= (Sum % RA * Scores*0.01)/2 90% 10% 100% Rt Bank CI > CI % Riparian Area> 1.35 Left Bank 0.75 Lt Bank CI > 1.43 1.39 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	03/08/2019	63-C	127	N/A
4. CHANNEI livestock	L ALTERATION: Stream cross	ings, riprap, concr			traightening of ch	annel, channeliza	tion, embankmer		rictions,
				al Category				NOTES>>	
	Negligible	Mir	nor		erate	Sev	ere		
				40 - 60% of reach	60 - 80% of reach				
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is	guidelines. If stream has been channelized, normal stable stream meander	of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander	Greater than 80% of by any of the chanr in the parameter g 80% of banks sh riprap, or	iel alterations listed uidelines AND/OR ored with gabion,		
	or hardening absent. Stream has an	the stream reach is disrupted by any of the channel alterations listed in the parameter	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter	of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable	of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable	in the parameter g 80% of banks sho	iel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.12 RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\9999.01\Images\Stream Assessment\IMG_2733.jpg)



Looking southwest (downstream) at Stream Reach 63-B. Erosion is present along both banks as a result of stormwater surges, but the majority of banks are stable. Both banks' riparian buffers are primarily forested with greater than 60% tree canopy cover but contain canopy gaps dominated by dense herbaceous vegetation. Stable habitat elements are present in 10-30% of the reach. The upstream end of the reach is fed by a culvert, disrupting less than 20% of the reach.

DESCRIBE PROPOSED IMPACT:	DE	SCR	BE I	PRO	POSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 03/10/2019 64-A 30 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map S-64: BM1A-4A, BL1A-4A JF/JB/WN Tributary of Little Marrowbone Creek 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) preser resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 90% 10% 100% Right Bank Score > 0.85 0.5 CI= (Sum % RA * Scores*0.01)/2 90% 10% 100% Rt Bank CI > CI % Riparian Area> 0.82 Left Bank 0.85 0.5 Lt Bank CI > 0.82 0.82 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	03/10/2019	64-A	30	N/A
4. CHANNE	L ALTERATION: Stream cross	ings, riprap, concr			traightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,
	Negligible	Conditional Category Moderate Severe				ere	NOTES>>		
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel alterations listed in	20-40% of the stream reach is disrupted by any of the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel	Greater than 80% o	f reach is disrupted lel alterations listed uidelines AND/OR ored with gabion,	1	
		the parameter guidelines.	guidelines.	stream meander pattern has not recovered.	stream meander pattern has not recovered.				

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\9999.01\Images\Stream Assessment\IMG_2733.jpg)



Looking northeast (upstream) at Stream Reach 64-A. The banks are often incised with relatively low bank slopes. Both banks' riparian buffers are dominated by dense herbaceous vegetation and tree and shrub layers occupying less than 30% of the canopy. Impervious surfaces are present on the outer third of each bank's riparian area. Instream habitat elements are unstable and occupy less than 10% of the reach. This stream reach flows into a culvert, disrupting less than 20% of the total reach.

)	ES	CF	RIBE	PRO	POSED	IMP/	CT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 03/10/2019 64-B 317 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map S-64: BM1-14, BL1-12 JF/JB/WN Tributary of Little Marrowbone Creek 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sediment deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) preser resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

0.90

High

Score

1.5

	St	ream Ir	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	r (VDOT)	Henry	R4	03010103	03/10/2019	64-B	317	N/A
4. CHANNEL livestock	ALTERATION: Stream cross	ings, riprap, conc		concrete blocks, s	traightening of ch	annel, channeliza		nts, spoil piles, constr	ictions,
	Negligible	Mi	nor		erate	Sev	rere	NOTES	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is	is disrupted by any of the channel	is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not	Greater than 80% of by any of the chann	uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

1.22

1.30

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

0.5

COMPENSATION REQUIREMENT (CR) >> N/A CR = RCI X LF X IF

INSERT PHOTOS:

SCORE

(WSSI Photo Location L:\9999.01\Images\Stream Assessment\IMG_2733.jpg)



Looking southwest (downstream) at Stream Reach 64-B. The channel is slightly incised with mostly stable banks (60-80%). Both the left and right banks' riparian buffers are composed of forest providing greater than 60% tree canopy cover. Instream habitat elements are present in 10-30% of the reach. The downstream and upstream ends of the reach are culverted, disrupting less than 20% of the reach.

DESCRIBE PROPOSED IMPACT:	DE	SCR	ΒE	PRO	POSED	IMPACT
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 03/10/2019 64-C 59 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map S-64: BH1-6, BI1-6 JF/JB/WN Tributary of Little Marrowbone Creek 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 40% 60% 100% Right Bank 0.85 Score > 0.5 CI= (Sum % RA * Scores*0.01)/2 40% 60% 100% Rt Bank CI > CI % Riparian Area> 0.71 Left Bank 0.85 Lt Bank CI > 0.71 0.71 0.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	tream Ir	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	03/10/2019	64-C	59	N/A
4. CHANNEI livestock	L ALTERATION: Stream cross	sings, riprap, conc		concrete blocks, s	traightening of ch	annel, channeliza		nts, spoil piles, const	rictions,
	Negligible	Mi	nor	Mode	erate	Sev	/ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter quidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter quidelines.	is disrupted by any	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable	Greater than 80% of by any of the channin the parameter g	nei aiterations listed juidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 0.86 RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

1.10

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

SCORE

(WSSI Photo Location L:\9999.01\Images\Stream Assessment\IMG_2733.jpg)



Looking southwest (downstream) at Stream Reach 64-C. The channel is often incised with relatively low bank slopes. Impervious surfaces are in the immediate vicinity of both banks; non-impervious areas are dominated by dense herbaceous regetation, with shrub and tree cover providing less than 30% tree canopy. Instream habitat elements are unstable and are present in less than 10% of the reach. The downstream and upstream ends of the reach are fed by a culvert, disrupting 20-40% of the reach.

DESCRIBE	PROPOSED	IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 03/08/2019 64-D 187 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map S-64: AO12-AK80, AP11-AK8 JF/JB/WN Tributary of Little Marrowbone Creek 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 0.6 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 0.60 Left Bank Lt Bank CI > 0.60 0.60 0.6 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

0.50

High

Score

1.5

Stream Impact Assessment Form Page 2									
Project #	Project Name (Applicant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor	
30544.01	Martinsville Connector (VDOT)	Henry	R4	03010103	03/08/2019	64-D	187	N/A	
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions,									

			Condition	al Category			NOTES>
	Negligible	Mi	nor	Mod	erate	Severe	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	of the channel	is disrupted by any of the channel alterations listed in the parameter guidelines. If	of the channel alterations listed in	Greater than 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks shored with gabion, riprap, or cement.	
SCORE	1.5	1.3	1.1	0.9	0.7	0.5	

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

0.96

CI 1.30

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2) COMPENSATION REQUIREMENT (CR) >>

N/A CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\9999.01\Images\Stream Assessment\IMG_2733.jpg)



Looking south (downstream) at Stream Reach 64-D. Both banks' riparian buffers consist of actively grazed pasture. Instream habitat elements are lacking, and are present in less than 10% of the reach. The upstream end of the reach is fed by a culvert, disrupting less than 20% of the reach.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 03/11/2019 65-A 43 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map S-65: BU11-13 JF/JB/WN Tributary of Marrowbone Creek 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	03/11/2019	65-A	43	N/A
vestock	L ALTERATION: Stream cross		Condition	al Category				NOTES>>	ionorio,
	Negligible	Mir	nor		erate	Sev	/ere		
				40 - 60% of reach					
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	is disrupted by any of the channel alterations listed in	by any of the chann	nei aiterations listed juidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2) COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\9999.01\Images\Stream Assessment\IMG_2733.jpg)



Looking southeast (downstream) at Stream Reach 65-A. The channel is slightly incised with mostly stable banks (60-80%). Both riparian buffers are composed of forest providing greater than 60% tree canopy cover. Stable habitat elements are present in 30-50% of the reach. There is no evidence of channel alteration within the reach.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 03/11/2019 66-A 107 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map S-66: BU1-9, BT1-9 JF/JB/WN Tributary of Marrowbone Creek 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 1.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

Stream Impact Assessment Form Page 2									
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	03/11/2019	66-A	107	N/A
4. CHANNEI livestock	L ALTERATION: Stream cross	sings, riprap, conci		concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, constr	ictions,
	Negligible	Mi	nor	Mod	erate	Sev	/ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is disrupted by any of the channel	is disrupted by any of the channel		Greater than 80% of by any of the chann			

0.7

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

1.5

THE REACH CONDITION INDEX (RCI) >>

1.30

RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2) COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

0.5

INSERT PHOTOS:

SCORE

(WSSI Photo Location L:\9999.01\Images\Stream Assessment\IMG_2733.jpg)



Looking east (downstream) at Stream Reach 66-A. The channel is deeply incised, restricting flow to within the banks. Both riparian buffers are composed of forest providing greater than 60% tree canopy cover. Habitat elements are unstable and are present in less than 10% of the reach. A culvert is disrupting less than 20% of the reach.

DESCRIBE	PROPOSED	IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 03/11/2019 67-A 214 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map S-67: BQ1-12, BP1-12 JF/JB/WN Tributary of Marrowbone Creek 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 70% 10% 20% 100% Right Bank Score > 1.5 0.5 0.6 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.22 Left Bank Lt Bank CI > 1.50 1.36 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

30544.01 Martinsville Connector (VDOT) Henry R4 03010103 03/11/2019 67-A 214 N/A CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, restock Conditional Category Negligible Minor Moderate Channel Alteration Channelization, dredging, alteration, or hardering absent. Stream has an unaltered pattern or has naturalized. Channel Alterations listed in the parameter guidelines. If stream has ben channelized, normal stable stream meander guidelines. If stream has ben channelized, normal stable stream meander pattern has not stream	Stream Impact Assessment Form Page 2									
Channel Alteration Alteration Alteration Channel Alteration Alteration	Project #	Project Name (App	licant)	Locality		HUC	Date		•	-
Channel Alteration Channel an unaltered pattern or has naturalized. Channel is disrupted by any of the channel alterations listed in the parameter guidelines. If the parameter guidelines. Channel is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not the parameter guidelines. If the parameter guidelines are meander pattern has not the p	30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	03/11/2019	67-A	214	N/A
Channel Alteration Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Channelization absent. Stream has an unaltered pattern or has naturalized. Channelization, dredging, alteration, is tream has an unaltered pattern or has naturalized. Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Channelized, or hardening absent. Stream has an unaltered pattern or has naturalized. Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander guidelines. If stream has been channelized, normal stable stream meander pattern has not	4. CHANNEI livestock	L ALTERATION: Stream cross	ings, riprap, concr			traightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, consti	rictions,
Channel Alteration Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Channelization, dredging, alteration, or hardening absent. Stream has bean unaltered pattern or has naturalized. Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not patter					al Catagory				NOTEO	
recovered, recovered,		Negligible	Mir			erate	Sev	rere	NOTES>>	

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\9999.01\Images\Stream Assessment\IMG_2733.jpg)



Looking northwest (upstream) at Stream Reach 67-A. The channel is often incised, with erosion present on both banks. The right bank's riparian buffer is composed largely of forest providing greater than 60% tree canopy cover, with a bit of encroachment by impervious roadway and maintained grass. The left bank's riparian buffer is composed entirely of forest providing greater than 60% canopy cover. Habitat elements are present in less than 10% of the reach. There is a culvert at the upstream end of the reach is disrupting less than 20% of the reach.

DESCRIBE PROPOSED IMPACT:	DE	SCR	BE I	PRO	POSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 03/11/2019 67-B 32 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map S-67: BQ12-15, BP18-21 JF/JB/WN Tributary of Marrowbone Creek 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 1.60 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 90% 10% 100% Right Bank Score > 1.5 0.6 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.41 Left Bank Lt Bank CI > 1.50 1.5 1.46 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	olicant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	03/11/2019	67-B	32	N/A
4. CHANNEI livestock	L ALTERATION: Stream cross	sings, riprap, concr			traightening of ch	annel, channeliza	tion, embankmer		rictions,
	Neglinikle	NA:		al Category		C		NOTES>>	
	Negligible	Mir	ioi	40 - 60% of reach	erate	Sev	/ere		
		Less than 20% of		is disrupted by any	is disrupted by any				
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	of the channel	guidelines. If	alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	by any of the chann	uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\9999.01\Images\Stream Assessment\IMG_2733.jpg)



Looking northeast (downstream) at Stream Reach 67-B. The channel is incised and the majority of both banks are nearly vertical. The right bank's riparian buffer is largely composed of forest providing greater than 60% canopy cover, with some encroachment by maintained grass. The left bank's riparian buffer is composed entirely of forest providing greater than 60% tree canopy cover. Habitat elements are present in less than 10% of the reach. There is no evidence of channel alteration within the reach.

DESCRIBE	PROPOSED	IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 03/11/2019 67-C 24 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map S-67: BP13-18 JF/JB/WN Tributary of Marrowbone Creek 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 1.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 30% 50% 20% 100% Right Bank Score > 1.5 0.5 0.6 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 0.82 Left Bank Lt Bank CI > 1.50 1.16 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\9999.01\Images\Stream Assessment\IMG_2733.jpg)



Looking east (downstream) at Stream Reach 67-C. The channel is deeply incised, restricting flow to within the banks. The right bank's riparian buffer is composed of impervious surface, maintained grass associated with the impervious surface, and forest with greater than 60% tree canopy cover. The left bank's riparian buffer is composed entirely of forest with greather than 60% tree canopy cover. Habitat elements are present in less than 10% of the reach. There is no evidence of channel alteration within the reach.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 03/10/2019 68-A 189 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map 68-A, BA1-9; AZ1-12, BC1-3 JF/JB/WN Tributary of Marrowbone Creek 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 1.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 15% 65% 20% 100% Right Bank 0.85 Score > 0.6 0.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 0.62 Left Bank Lt Bank CI > 1.50 1.06 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	03/10/2019	68-A	189	N/A
4. CHANNEI ivestock	_ ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, constr	ictions,
	Negligible	Mit	nor	Mod	erate	Sev	ere		
Channel		Less than 20% of the stream reach	20-40% of the stream reach is	is disrupted by any of the channel			if reach is discunted		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

1.30

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2) COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

0.5

INSERT PHOTOS:

SCORE

(WSSI Photo Location L:\9999.01\Images\Stream Assessment\IMG_2733.jpg)



Looking east (downstream) at Stream Reach 68-A. Severe incision restricts flow to within the banks. The right bank's riparian buffer is occupied by impervious surfaces, mowed lawns associated with the impervious area, and non-maintained herbaceous vegetation with less than 30% tree canopy cover. The left bank's riparian is forested with greater than 60% tree canopy cover. Habitat elements are present in less than 10% of the reach. The upstream end of the reach is fed by a culvert, disrupting less than 20% of the reach.

DESCRIBE PROPOSED IMPACT:	DE	SCR	BE I	PRO	POSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R4 03010103 03/10/2019 69-A 35 N/A Henry Stream Name and Information Name(s) of Evaluator(s) Stream Map 69-A: AZ12-15, BC1-3 JF/JB/WN Marrowbone Creek 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

0.50

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	03/10/2019	69-A	35	N/A
4. CHANNEL livestock	L ALTERATION: Stream cross	ings, riprap, concr			traightening of ch	annel, channeliza	tion, embankmer		rictions,
			Conditions	ol Cotogory					
				al Category				NOTES>>	
	Negligible	Mir		Mod	erate	Sev	ere	NOTES>>	
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is	Modisupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander	Greater than 80% o by any of the chann in the parameter g 80% of banks sho riprap, or	f reach is disrupted el alterations listed uidelines AND/OR ored with gabion,		
	Channelization, dredging, alteration, or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable	Greater than 80% o by any of the chann in the parameter g 80% of banks sho	f reach is disrupted el alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2) COMPENSATION REQUIREMENT (CR) >>

N/A CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\9999.01\Images\Stream Assessment\IMG_2733.jpg)



Looking northeast (upstream) at Stream Reach 69-A. The banks show areas of erosion, but vegetative protection is present along 60-80% of the reach. Both banks' riparian buffers are fully forested (>60% tree canopy cover). Habitat elements are unstable and are present in less than 10% of the reach. No channel alteration present within the reach.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 03/10/2019 70-A 58 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map 70-A: BB1-4 JF/JB/WN Tributary of Marrowbone Creek 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	03/10/2019	70-A	58	N/A
	L ALTERATION: Stream crossi	ings, riprap, conci	rete, gabions, or o	concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmen	ts, spoil piles, const	rictions,
livestock			Conditions	al Category				NOTES	
livestock	Negligible	Min	Conditiona nor	al Category	erate	Sev	rere	NOTES>>	

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

CI

0.90

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

0.5

INSERT PHOTOS:

SCORE

(WSSI Photo Location L:\9999.01\Images\Stream Assessment\IMG_2733.jpg)



Looking south (downstream) at Stream Reach 70-A. The stream shows signs of erosion but the banks are mostly stable (60-80%). Both banks' riparian buffers are fully forested (>60% canopy cover). Instream habitat elements are present in 10-30% of the reach. The upstream end of the reach is fed by a culvert and rip rap is present immediately below; channel alteration effects 40-60% of the stream reach.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 03/10/2019 71-A 76 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map 71-A: BB3-BE1-6, BB2-BD1-6 JF/JB/WN Tributary of Marrowbone Creek 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR naiority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. 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Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 30% 35% 25% 10% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank 0.75 0.5 0.6 Lt Bank CI > 0.90 1.20 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes **Conditional Category** NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	03/10/2019	71-A	76	N/A
4. CHANNEI livestock	L ALTERATION: Stream cross	ings, riprap, conci		concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,
	Negligible	Mi	nor	Mod	orato	Cox		NO I ES>>	
					erate	Sev	/ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel	Greater than 80% of by any of the chann in the parameter g	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\9999.01\Images\Stream Assessment\IMG_2733.jpg)



Looking northwest (upstream) at Stream Reach 71-A. The stream is slightly incised but the majority of banks are stable (60-80%). The left bank riparian buffer has impervious surface, mowed grass associated with the impervious surface, riparian areas lacking shrub and tree cover, and minimal tree canopy cover. The right bank's riparian buffer is fully forested (>60% canopy cover). Instream habitat is present in less than 10% of the reach. The upstream end of the reach is fed by a culvert, disrupting less than 20% of the reach.

	DESCRIBE	PROPOSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 03/10/2019 72-A 516 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JF/JB/WN Tributary of Little Marrowbone Creek 72-A: AU1-21, AV1-21 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. 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Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 40% 60% 100% Right Bank 0.85 Score > 0.5 CI= (Sum % RA * Scores*0.01)/2 40% 60% 100% Rt Bank CI > CI % Riparian Area> 0.71 Left Bank 0.85 Lt Bank CI > 0.71 0.71 0.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat in greater than 50% of the reach. Cover are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	03/10/2019	72-A	516	N/A
4. CHANNEL livestock	ALTERATION: Stream cross	ings, riprap, concr			traightening of ch	annel, channeliza	ition, embankmer	nts, spoil piles, constr	ictions,
				al Category				NOTES>>	
	Negligible	Mir	nor		erate	Sev	/ere		
				40 - 60% of reach					

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

1.5

THE REACH CONDITION INDEX (RCI) >> 0.94 RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

1.10

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

0.5

N/A

INSERT PHOTOS:

SCORE

(WSSI Photo Location L:\9999.01\Images\Stream Assessment\IMG_2733.jpg)



Looking north (upstream) at Stream Reach 72-A. Active erosion is occurring, with vegetative protection on 40-60% of the banks within the reach. Both riparian buffers are encroached upon by paved asphalt, with dense herbaceous vegetation occupying the space between the stream and pavement. Stable habitat elements are present in 10-30% of the reach. The reach is culverted across Joseph Martin Highway (Rt. 641) and the upstream end of the reach is fed by a culvert, disrupting 20-40% of the reach.

DESCRIBE PROPOSED IMPACT:	DE	SCR	BE I	PRO	POSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 03/10/2019 72-B 352 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map 72-B: AV21-42, AU21-37 JF/JB/WN Tributary of Little Marrowbone Creek 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 1.60 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 5% 30% 20% 45% 100% Right Bank Score > 1.5 0.75 0.5 0.6 CI= (Sum % RA * Scores*0.01)/2 10% 90% 100% Rt Bank CI > CI % Riparian Area> 0.67 Left Bank Lt Bank CI > 0.69 0.68 1.5 0.6 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat in greater than 50% of the reach. Cover are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	ream Ir	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	03/10/2019	72-B	352	N/A
A CHANNEI	ALTEDATION: Stroom orose	ingo rinton cono	roto achiono or	annorata blacka a	traightaning of ah	annal ahannaliza	tion ombonkmor	to apoil piles sepat	riotiono
4. CHANNEL livestock	_ ALTERATION: Stream cross	ings, riprap, conc		concrete blocks, so	traightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,
	- ALTERATION: Stream cross Negligible			al Category	erate		tion, embankmer		rictions,

channelized, normal stable

stream meander

pattern has not

0.7

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

channelized, normal stable

stream meander

pattern has not

the parameter guidelines.

1.1

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

1.5

the paramete guidelines.

1.3

THE REACH CONDITION INDEX (RCI) >> 0.90

CI

1.30

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

0.5

INSERT PHOTOS:

SCORE

(WSSI Photo Location L:\9999.01\Images\Stream Assessment\IMG_2733.jpg)



Looking north (upstream) at Stream Reach 72-B. The right bank's riparian buffer contains impervious surfaces, maintained grass associated with the impervious surfaces, non-maintained herbaceous vegetation, and a minimal amount of tree canopy cover. The left bank's riparian buffer is occupied by mowed grass and areas of forest with greater than 60% tree canopy cover. Stable habitat elements are present in 10-30% of the reach. The downstream and upstream ends of the reach are culverted, disrupting less than 20% of the reach.

DESCRIBE PROPOSED IMPACT:	DE	SCR	BE I	PRO	POSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 03/11/2019 72-C 67 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JF/JB/WN Tributary of Marrowbone Creek S-72: BY1-5, BZ4-10 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 1.60 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	03/11/2019	72-C	67	N/A
			•						
4. CHANNEI livestock	ALTERATION: Stream crossi	ings, riprap, concr		concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer	ts, spoil piles, constri	ictions,
	ALTERATION: Stream crossi			al Category	erate		tion, embankmer		ictions,

stream has beer

channelized, normal stable

stream meander

pattern has not

recovere

Greater than 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR

80% of banks shored with gabion, riprap, or cement.

1.3 1.1 0.9 0.7 0.5 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

ream has beer

channelized, normal stable

stream meande

pattern has not

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

0.90

CI

0.90

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2) COMPENSATION REQUIREMENT (CR) >>

N/A CR = RCI X LF X IF

INSERT PHOTOS:

SCORE

unaltered pattern or has naturalized.

1.5

(WSSI Photo Location L:\9999.01\Images\Stream Assessment\IMG_2733.jpg)

Iterations listed i

the parameter guidelines.

Iterations listed

the parameter guidelines.



Looking east (upstream) at Stream Reach 72-C. The channel exhibits vertical banks and is overwidened. The left and right banks' riparian buffers are composed of forest providing greater than 60% tree canopy cover. Habitat elements are lacking and are present in less than 10% of the reach. The reach has culverts at both ends, disrupting 40-60% of the reach.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 03010103 03/07/2019 73-A 421 N/A Henry Name(s) of Evaluator(s) Stream Name and Information Stream Map JF/JB/WN Little Marrowbone Creek S-73: AK1A-36, AJ1-33 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 20% 80% 100% Right Bank Score > 0.85 0.6 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > 0.65 CI % Riparian Area> Left Bank Lt Bank CI > 1.50 1.08 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

	St	ream Im	pact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	нис	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	r (VDOT)	Henry	R3	03010103	03/07/2019	73-A	421	N/A
4. CHANNEL livestock	L ALTERATION: Stream cross	ings, riprap, concre	te, gabions, or o	concrete blocks, st	traightening of ch	annel, channeliza	ition, embankmer	ts, spoil piles, const	rictions,
			Conditiona	al Category				NOTES>>	
	Negligible	Mino	or	Mode	erate	Sev	/ere		

s disrupted by an s disrupted by an of the channel Less than 20% of 20-40% of the terations listed in the parameter guidelines. If Iterations listed in the parameter guidelines. If Greater than 80% of reach is disrupted by any of the channel alterations lister in the parameter guidelines AND/OR Channel the stream reach s disrupted by an stream reach is disrupted by any Channelization, dredging, alteration, or hardening absent. Stream has an Alteration of the channel of the channel tream has beer stream has been Iterations listed in the parameter guidelines. 80% of banks shored with gabion, riprap, or cement. unaltered pattern or has naturalized. Iterations listed i channelized, normal stable channelized, normal stable the parameter guidelines. stream meande stream meande pattern has not pattern has not recovere **SCORE** 1.5 1.3 1.1 0.9 0.7 0.5

CI 1.30

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

1.12

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\9999.01\Images\Stream Assessment\IMG_2733.jpg)



Looking south (downstream) at Stream Reach 73-A. The banks are often incised and there erosion is present on 40-60% of both banks. The left bank's riparian buffer is forested with greater than 60% tree canopy cover; the right bank's riparian buffer is covered largely by dense shrubbery, with maintained lawn encroaching the riparian buffer in some areas. Stable habitat elements are present in 30-50% of the reach. A road exists at the downstream end of the reach, disrupting less than 20% of the reach.

DESCRIBE PROPOSED IMPAC	T:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 03010103 03/08/2019 73-B 397 N/A Henry Name(s) of Evaluator(s) Stream Name and Information Stream Map S-73: AK49-64, AN1-4, AK77-82; AJ34-48, AM5-9, AM12-14 JF/JB/WN Little Marrowbone Creek 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. 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Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) preser resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. 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Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 10% 90% 100% Right Bank Score > 1.5 0.75 CI= (Sum % RA * Scores*0.01)/2 98% 100% Rt Bank CI > CI % Riparian Area> 2% 0.83 Left Bank 0.75 Lt Bank CI > 0.77 0.80 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat in greater than 50% of the reach. Cover are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

Stream Impact Assessment Form Page 2										
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor	
30544.01	Martinsville Connecto	r (VDOT)	Henry	R3	03010103	03/08/2019	73-B	397	N/A	
4 CHANNEI	ALTEDATION -									
livestock	L ALTERATION: Stream cross	ings, riprap, conci		concrete blocks, so	traightening of ch	annel, channeliza		nts, spoil piles, const	rictions,	
	Negligible			al Category	traightening of cherate				rictions,	

stream meander

pattern has not

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

stream meander

pattern has not

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

1.5

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

CI

1.30

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

0.5

INSERT PHOTOS:

SCORE

(WSSI Photo Location L:\9999.01\Images\Stream Assessment\IMG_2733.jpg)



Looking north (upstream) at Stream Reach 73-B. There are a few areas of erosion within the reach but the majority of the banks are stable. The riparian buffers are largely lacking tree and shrub strata and consists of maintained lawn. The right bank riparian buffer contains a wetland. Stable habitat elements are present within 30-50% of the reach. The downstream end of the reach contains a culvert, disrupting less than 20% of the stream.

	DESCRIBE	PROPOSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 03/07/2019 74-A 378 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JF/JB/WN Tributary of Little Marrowbone Creek S-74: AF1-24; AE1-15, AG4-15 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

Stream Impact Assessment Form Page 2									
Project #	Project Name (App	licant)	Locality	Cowardin Class.	нис	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	03/07/2019	74-A	378	N/A
4. CHANNEI livestock	L ALTERATION: Stream cross	ings, riprap, conci		concrete blocks, s	straightening of ch	annel, channeliza		nts, spoil piles, constr	ictions,
	Negligible	Mi	nor		erate	Sev	/ere	NO I LOSS	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter	20-40% of the stream reach is	of the channel	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable	Greater than 80% of by any of the chann in the parameter g 80% of banks sh	uidelines AND/OR		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

1.50

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

0.5

INSERT PHOTOS:

SCORE

(WSSI Photo Location L:\9999.01\Images\Stream Assessment\IMG_2733.jpg)



Looking southeast (downstream) at Stream Reach 74-A. The reach exhibits a few incised and/or undercut banks but the majority of the streambank is stable. Both banks' riparian buffers are forested with greater than 60% tree canopy cover. Stable habitat elements are present and occupy 30-50% of the reach. The stream shows no signs of alteration.

DESCRIBE	PROPOSED	IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 03010103 03/07/2019 75-A 87 N/A Henry Name(s) of Evaluator(s) Stream Name and Information Stream Map S-75: AC1-9, AD8-9; AB1-7 JF/JB/WN Little Marrowbone Creek 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 3.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 99% 1% 100% Right Bank Score > 1.5 0.5 CI= (Sum % RA * Scores*0.01)/2 99% 1% 100% Rt Bank CI > CI % Riparian Area> 1.49 Left Bank 0.5 Lt Bank CI > 1.49 1.5 1.49 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.50

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	Project Name (Applicant) Locality Cowardin Class.		HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor	
30544.01	Martinsville Connector (VDOT)		Henry	R3	03010103	03/07/2019	75-A	87	N/A
4. CHANNEL livestock	- ALTERATION: Stream crossi	ings, riprap, conci		concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,
	ALTERATION: Stream crossi			al Category	erate		tion, embankmer		rictions,

channelized, normal stable

stream meander

pattern has not

recovere

0.7

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

channelized, normal stable

stream meande

pattern has not

Iterations listed

the parameter guidelines.

1.1

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

unaltered pattern or has naturalized.

1.5

THE REACH CONDITION INDEX (RCI) >>

1.46

CI

1.30

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

80% of banks shored with gabion, riprap, or cement.

0.5

INSERT PHOTOS:

SCORE

(WSSI Photo Location L:\9999.01\Images\Stream Assessment\IMG_2733.jpg)

Iterations listed i

the parameter guidelines.

1.3



Looking west (downstream) at Stream Reach 75-A. The majority of the banks are stable (>80%). Both banks' riparian buffers are fully forested. Stable habitat elements are present in greater than 50% of the reach. A road exists at the downstream end of the reach, disrupting less than 20% of the reach.

DESCRIBE	PROPOSED	IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 03010103 03/07/2019 75-B 421 N/A Henry Name(s) of Evaluator(s) Stream Name and Information Stream Map S-75: AB8-40, AD10-42 JF/JB/WN Little Marrowbone Creek 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 95% 5% 100% Right Bank 0.75 Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.46 Left Bank Lt Bank CI > 1.50 1.5 1.48 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

Stream Impact Assessment Form Page 2									
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	03/07/2019	75-B	421	N/A
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock Conditional Category									
	Negligible	Mir	nor		lerate	Sev	/ere	NOTEO	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter quidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter quidelines.	of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable	Greater than 80% of by any of the chann in the parameter g 80% of banks sh	of reach is disrupted nel alterations listed juidelines AND/OR ored with gabion, r cement.		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

1.30

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2) COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

0.5

INSERT PHOTOS:

SCORE

(WSSI Photo Location L:\9999.01\Images\Stream Assessment\IMG_2733.jpg)



Looking southwest (upstream) at Stream Reach 75-B. The banks are slightly incised but mostly stable. Both banks' riparian buffers are forested (>60% canopy cover); a canopy gap on the right bank is occupied by dense herbaceous vegetation. Stable habitat elements are present in 30-50% of the reach. The upstream end of the reach is fed by a culvert, disrupting less than 20% of the reach.

DESCRIBE PROPOSED IMPACT:	DE	SCR	BE	PRO	POSED	IMPACT
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 03/07/2019 75-C 217 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map S-75: AD42-58, AB40-55 JF/JB/WN Tributary of Little Marrowbone Creek 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. 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Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 70% 20% 10% 100% Right Bank Score > 1.5 0.75 0.6 CI= (Sum % RA * Scores*0.01)/2 90% 10% 100% Rt Bank CI > CI % Riparian Area> 1.26 Left Bank 0.6 Lt Bank CI > 1.41 1.34 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	03/07/2019	75-C	217	N/A
I. CHANNEI vestock	L ALTERATION: Stream cross	ings, riprap, concr			traightening of ch	annel, channeliza	tion, embankmer		rictions,
			Conditiona	al Category				NOTES>>	
						_			
	Negligible	Miı	nor		erate	Sev	rere		
		Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander	Greater than 80% o	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable	Greater than 80% of by any of the chanr in the parameter g	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion, cement.		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\9999.01\Images\Stream Assessment\IMG_2733.jpg)



Looking southwest (upstream) at Stream Reach 75-C. The banks are slightly incised but largely stable. The right bank's riparian buffer is predominantly forested (>60% canopy cover), though there are areas of dense herbaceous vegetation and maintained lawn. The left bank's riparian buffer is predominantly forested (>60% canopy cover) but contains some maintained lawn. Stable habitat elements are present in 30-50% of the reach. The stream shows no signs of alteration.

DESCRIBE PROPOSED IMPACT:	DE	SCR	BE I	PRO	POSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 03/07/2019 76-A 124 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map S-76: AC9-15, AD1-8 JF/JB/WN Tributary of Little Marrowbone Creek 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 60% 40% 100% Right Bank 0.75 Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.05 Left Bank Lt Bank CI > 1.50 1.28 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\9999.01\Images\Stream Assessment\IMG_2733.jpg)



Looking southwest (upstream) at Stream Reach 76-A. The reach has some areas of erosion but the majority of the banks are stable. The right bank's riparian buffer has greater than 60% canopy cover with maintained herbaceous vegetation, while the left bank's riparian buffer is entirely forested with greater than 60% canopy cover. Stable habitat elements are present in 30-50% of the reach. The stream shows no signs of channel alteration.

Ephemeral Stream Assessment Form (Form 1a)

Unified Stream Methodology for use in Virginia

		roi us	e ili epilelilerai s	lieallis				
Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor
30544.01	Martinsville Connector (VDOT)	Henry	R6	03010103	2/27/2019	77-A	208	N/A

Name(s) of Evaluator(s) Stream Name and Information Stream Map JB/ WN/ JF Unnamed Tributary to Marrowbone Creek S-77: A1-12, B1-12

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

		Con	ditional Cate	gory			
	Optimal	Subo	ptimal	Mar	ginal	Po	oor
Riparian Buffers	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an non-maintained understory. Wetlands areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	>30% tree canopy	High Marginal: Non-maintained, dense herbaceous vegetation with	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with 30% tree canopy cover with maintained understory.	and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces row crops, active feed lots, trails, o other comparable conditions.
		High	Low	High	Low	High	Low
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5

Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the

descriptors. 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you

0.6

3. Enter the % Riparian Area and Score for each riparian category in the blocks below.

Right Bank	% Riparian Area>	95%	5%	
Kigik Bank	Score >	1.2	0.6	
	% Riparian Area>	90%	10%	

1.2 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

Lt Bank CI > 1.14 1.16 THE REACH CONDITION INDEX (RCI) >> 0.58

Rt Bank CI >

CI= (Sum % RA * Scores*0.01)/2

1.17

CI

NOTES>>

RCI= (Riparian CI)/2 COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

Ensure the sums

of % Riparian

Blocks equal 100

100%

100%

INSERT PHOTOS:

Left Bank



Looking upstream at Stream Reach 77-A. The right and left riparian buffers consist of 100% optimal canopy cover.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 03/06/2019 78-A 650 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JF/JB/WN Tributary of Marrowbone Creek S-78: AA9-21, X5-17; Z25-31 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 90% 10% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank 0.85 Lt Bank CI > 1.44 1.5 1.47 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	03/06/2019	78-A	650	N/A
1. CHANNEI ivestock	L ALTERATION: Stream cross	ings, riprap, concr			traightening of ch	annel, channeliza	tion, embankmer		rictions,
	No. of other			al Category	erate	0		NOTES>>	
	Negligible	Mir	nor	I IVIOO					
						Sev	rere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander	Greater than 80% o	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		
	or hardening absent. Stream has an	the stream reach is disrupted by any of the channel alterations listed in the parameter	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable	Greater than 80% of by any of the chanr in the parameter g	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\9999.01\Images\Stream Assessment\IMG_2733.jpg)



Looking southwest (downstream) at Stream Reach 78-A. Active erosion is present on both banks; vegetative protection is present on 40-60% of the reach. There is some maintained lawn in the vicinity of the left bank, but both banks' riparian buffers are largely forested with greater than 60% tree canopy cover. Stable habitat elements are present and occupies 30-50% of the stream. There is no evidence of channel alteration.

DESCRIBE	PROPOSED	IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 03/06/2019 79-A 200 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map S-79: V1-10, W1-10 JF/JB/WN Tributary of Marrowbone Creek 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 50% 50% 100% Right Bank 0.75 Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.13 Left Bank Lt Bank CI > 1.50 1.31 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	03/06/2019	79-A	200	N/A
4. CHANNEL livestock	L ALTERATION: Stream cross	ings, riprap, concr			traightening of cha	annel, channeliza	tion, embankmer		rictions,
I	No off off L			al Category		0		NOTES>>	
	Negligible	Mir	nor		erate	Sev	ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	disrupted by any of the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	is disrupted by any of the channel	Greater than 80% of by any of the chann in the parameter g 80% of banks sh riprap, or	el alterations listed uidelines AND/OR ored with gabion,		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5]	
	REACH C	CONDITION	NDEX and S	STREAM CO	NDITION UN	IITS FOR TH	IS REACH		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\9999.01\Images\Stream Assessment\IMG_2733.jpg)



Looking north (downstream) at Stream Reach 79-A, an intermittent tributary of Marrowbone Creek. The stream is slightly incised but banks are stable. The right bank's riparian buffer is made up of forest providing greater than 60% tree canopy cover and maintained lawn, while the left bank's riparian buffer is entirely forested with greater than 60% tree canopy cover. Habitat elements are unstable and are present in less than 10% of the reach. The upstream end of the reach is fed by a culvert, disrupting less than 20% of the reach.

DESCRIBE	PROPOSED	IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC Data Point Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 03/06/2019 80-A 470 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map S-80: U1-18 JF/JB/WN Tributary of Marrowbone Creek 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank 0.75 Lt Bank CI > 0.75 1.13 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	03/06/2019	80-A	470	N/A
4. CHANNEL livestock	L ALTERATION: Stream cross	ings, riprap, conci			traightening of ch	annel, channeliza	tion, embankmer		rictions,
	Negligible	Mii		al Category	erate	Sev	rere	NOTES>>	
Channel Alteration	or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	is disrupted by any	Greater than 80% o	iel alterations listed uidelines AND/OR ored with gabion,		

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\9999.01\Images\Stream Assessment\IMG_2733.jpg)

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.



Looking southeast (downstream) at Stream Reach 80-A. There are a few areas of active erosion but the banks are generally stable. The left bank's riparian buffer is composed entirely of maintained lawn while the right bank's buffer is composed entirely of forest providing greater than 60% tree canopy cover. Habitat elements are stable and are present in 10-30% of the reach. The stream reach shows no signs of channel alteration.

DESCRIBE PROPOSED IMPACT:	DE	SCR	BE I	PRO	POSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 03/06/2019 81-A 11 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map S-81: O10-11, S1-2 JF/JB/WN Tributary of Marrowbone Creek 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 50% 50% 100% Right Bank Score > 1.5 0.75 CI= (Sum % RA * Scores*0.01)/2 70% 30% 100% Rt Bank CI > CI % Riparian Area> 1.13 Left Bank 0.75 Lt Bank CI > 1.28 1.20 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

Stream Impact Assessment Form Page 2									
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connector (VDOT)		Henry	R4	03010103	03/06/2019	81-A	11	N/A
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock Conditional Category NOTES>>									
	Negligible	NA:							
		IVIII	nor	Mod	erate	Sev	rere	NO I LOSS	

0.5

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

1.5

THE REACH CONDITION INDEX (RCI) >>

1.22

CI

1.30

RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

COMPENSATION REQUIREMENT (CR) >> N/A CR = RCI X LF X IF

INSERT PHOTOS:

SCORE

(WSSI Photo Location L:\9999.01\Images\Stream Assessment\IMG_2733.jpg)



Looking southwest (upstream) at Stream Reach 81-A. Vegetative protection is prominent within the reach and the stream has access to bankfull benches. Both the right and left bank riparian buffers are partly forested (>60% tree canopy cover) and partly composed of maintained lawn. Instream habitat elements are present within 30-50% of the reach. The upstream end of the reach is fed by a culvert, disrupting less than 20% of the reach.

DESCRIBE	PROPOSED	IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 03010103 03/06/2019 82-A 455 N/A Henry Stream Name and Information Name(s) of Evaluator(s) Stream Map JF/JB/WN Marrowbone Creek S-82: O1-10, S2-3; N2-10 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) preser resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 20% 80% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank 0.85 Lt Bank CI > 0.98 1.24 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat in greater than 50% of the reach. Cover are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (Applicant)		Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connector (VDOT)		Henry	R3	03010103	03/06/2019	82-A	455	N/A
4. CHANNEI ivestock	L ALTERATION: Stream cross	ings, riprap, concr			traightening of cha	annel, channeliza	tion, embankmer		ictions,
	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of cha	annel, channeliza	tion, embankmer	nts, spoil piles, constr	ictions,
	L ALTERATION: Stream cross Negligible			al Category	traightening of cha		tion, embankmer		ictions,

alterations listed in the parameter guidelines. If

stream has beer

channelized, normal stable

stream meander

pattern has not

0.7

recovere

Greater than 80% of reach is disrupted by any of the channel alterations lister in the parameter guidelines AND/OR

80% of banks shored with gabion, riprap, or cement.

0.5

0.9 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

alterations listed in the parameter

guidelines. If

tream has beer

channelized, normal stable

stream meande

pattern has not

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

1.19

CI

1.50

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

Channel

Alteration

SCORE

(WSSI Photo Location L:\9999.01\Images\Stream Assessment\IMG_2733.jpg)

the stream reach s disrupted by an

of the channel

Itarations listed i

the parameter guidelines.

1.3

Channelization, dredging, alteration, or hardening absent. Stream has an

unaltered pattern or has naturalized.

1.5

stream reach is disrupted by any

of the channel

Iterations listed

the parameter guidelines.

1.1



Looking south (upstream) at Stream Reach 82-A. Erosion is present on both banks with some areas being undercut. The right bank's riparian buffer is fully forested (>60% canopy cover). The left bank's riparian buffer is forested adjacent to the stream but then gives way to herbaceous ground cover. Instream habitat elements are adequate for the maintenance of populations and are present in 30-50% of the reach. The stream shows no evidence of channel alteration.

DESCRIBE PROPOSED IMPAC	T:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 03/06/2019 83-A 456 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JF/JB/WN Tributary of Marrowbone Creek S-83: K1-7, J1-7 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

Stream Impact Assessment Form Page 2									
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connector (VDOT)		Henry	R4	03010103	03/06/2019	83-A	456	N/A
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock Conditional Category									
			Conditiona	al Category				NOTES	
	Negligible	Mir	Conditiona nor		erate	Sev	/ere	NOTES>>	

stream meander pattern has not

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

stream meander pattern has not

1.1

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

1.5

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

1.26

CI

1.50

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

0.5

INSERT PHOTOS:

SCORE

(WSSI Photo Location L:\9999.01\Images\Stream Assessment\IMG_2733.jpg)



Looking northeast (upstream) at Stream Reach 83-A. The stream is slightly incised but the banks are generally stable. The left and right bank ripariain buffers have greater than 60% tree canopy cover. Habitat elements are present in 10-30% of the reach. The stream shows no signs of alteration.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 03/06/2019 84-A 43 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JF/JB/WN Tributary of Marrowbone Creek S-84: I5-7, L1-3 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.50

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (Applicant)		Project Name (Applicant) Locality Cowardin Class. HUC Da		Date	SAR # / Data Point	Impact / SAR length	Impact Factor	
30544.01	Martinsville Connector (VDOT)		Henry	R4	03010103	03/06/2019	84-A	43	N/A
4. CHANNEI livestock	L ALTERATION: Stream cross	ings, riprap, conci		concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,
	ALTERATION: Stream cross Negligible			al Category	traightening of ch		tion, embankmer		rictions,

tream has beer

channelized, normal stable

stream meande

pattern has not

stream has beer

channelized, normal stable

stream meander

pattern has not

0.7

recovere

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

Channelization, dredging, alteration, or hardening absent. Stream has an

unaltered pattern or has naturalized.

1.5

THE REACH CONDITION INDEX (RCI) >>

CI

1.50

RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

by any of the channel alterations liste in the parameter guidelines AND/OR

80% of banks shored with gabion, riprap, or cement.

0.5

INSERT PHOTOS:

SCORE

(WSSI Photo Location L:\9999.01\Images\Stream Assessment\IMG_2733.jpg)

s disrupted by any of the channel

Iterations listed i

the parameter guidelines.

1.3

Iterations listed

the parameter guidelines.

1.1



Looking northwest (downstream) at Stream Reach 84-A. There are a few areas of active erosion but the banks are generally stable. The left and right bank riparian buffer have greater than 60% tree canopy cover. Instream habitat elements are present in greater than 50% of the reach. This reach shows no signs of channel alteration.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 03/06/2019 85-A 477 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JF/JB/WN Tributary of Marrowbone Creek S-85: I5-7, L1-3 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

Stream Impact Assessment Form Page 2									
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connector (VDOT)		Henry	R4	03010103	03/06/2019	85-A	477	N/A
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock Conditional Category NOTES>>									
	Negligible	Mi	nor	Mode	erate	Sev	ere	11012022	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter quidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter quidelines.	is disrupted by any	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable	Greater than 80% of by any of the chang in the parameter g	uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.32 RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

1.50

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

SCORE

(WSSI Photo Location L:\9999.01\Images\Stream Assessment\IMG_2733.jpg)



Looking northwest (downstream) at Stream Reach 84-A. The reach had vegetation cover on 60 to 80% of the banks and the stream has access to bankfull benches. The left and right bank riparian buffer have greater than 60% tree canopy cover. Instream habitat elements are present in 30 to 50% of the reach. This reach shows no signs of channel alteration.

DESCRIBE PROPOS	SED IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 03/05/2019 86-A 67 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JF, JB, WN Tributary of Marrowbone Creek S-86: C1-5, D1-4 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 40% 60% 100% Right Bank Score > 1.5 0.6 CI= (Sum % RA * Scores*0.01)/2 70% 30% 100% Rt Bank CI > CI % Riparian Area> 0.96 Left Bank Lt Bank CI > 1.23 1.10 1.5 0.6 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\9999.01\Images\Stream Assessment\IMG_2733.jpg)



Looking southeast (upstream) at Stream Reach 86-A. Both left and right banks' riparian buffers have greater than 60% tree canopy cover and contain minimal maintained lawn. Habitat elements are present in 10-30% of the reach. There are no signs of channel alteration.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 03/05/2019 86-B 514 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map S-86: C5-22, D4-25 JF, JB, WN Tributary of Marrowbone Creek 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 1.60 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 70% 30% 100% Right Bank Score > 0.6 1.5 CI= (Sum % RA * Scores*0.01)/2 40% 60% 100% Rt Bank CI > CI % Riparian Area> 0.87 Left Bank Lt Bank CI > 0.96 0.92 1.5 0.6 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

Stream Impact Assessment Form Page 2											
Project #	Project Name (Applicant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor			
30544.01	Martinsville Connector (VDOT)	Henry	R4	03010103	03/05/2019	86-B	514	N/A			
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock											
	Conditional Category NOTES>>										

Rannel ration The parameter guidelines. If stream has been unaltered pattern or has naturalized. Negligible Minor Moderate Severe 40 - 500 of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable in the parameter of the parameter guidelines. If stream has been channelized, normal stable in the parameter guidelines AND/OR 80% of banks shored with gabion, riprap, or cement.
Less than 20% of the channel alterations listed in the parameter guidelines. If stream has been unaltered pattern or has naturalized. Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, of the channel alterations listed in the parameter guidelines. If stream has been channelized, of banks shored with gabion, groups or creameter guidelines. If stream has been channelized, of banks shored with gabion, groups or creameter guidelines. If stream has been channelized, groups or creameter guidelines. If stream has been channelized, groups or creameter guidelines. If stream has been channelized, groups or creameter guidelines. If stream has been channelized, groups or creameter guidelines. If stream has been channelized, groups or creameter guidelines. If stream has been channelized, groups or creameter guidelines. If stream has been channelized, groups or creameter guidelines. If stream has been channelized, groups or groups or creameter guidelines. If stream has been channelized.
guidelines. guidelines. guidelines. roomal stable stream meander pattern has not recovered. recovered.

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 0.86

CI 1.30

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2) COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\9999.01\Images\Stream Assessment\IMG_2733.jpg)



Looking northwest (downstream) at Stream Reach 86-B. This reach exhibits heavy sedimentation and is overwidened. The left and right banks' riparian buffers are forested (>60% canopy cover) and contain minimal maintained lawn. Habitat elements are generally lacking and are present in less than 10% of the reach. The channel is slightly altered in less than 20% of the reach by the presence of an erosional storm water feature.

DESCRIBE	PROPOSED	IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 03/05/2019 30544.01 Martinsville Connector (VDOT) R4 03010103 87-A 109 N/A Henry Name(s) of Evaluator(s) Stream Name and Information JF/JB/WN Tributary of Marrowbone Creek S-87: A9-13, B7-12 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow egetative protection present on less developed wide bankfull benches be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient than 80% of stream bed is covered by AND/OR V-shaped channels have diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 2.00 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 5% 95% 100% Right Bank Score > 0.5 0.85 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 10% 90% 100% Rt Bank CI > CI 0.83 Left Bank 1.1 0.85 Lt Bank CI > 0.88 0.85 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. Stream Gradient CI

Scores

1.5

0.9

0.5

High

0.50

Project # Project Name (Applicant) Locality Cowardin Class. HUC Date SAR # / Data Point length 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 03/05/2019 87-A 109 CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrict estock Conditional Category Negligible Minor Moderate Severe Moderate Severe Moder	Martinsville Connector (VI
CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictive stock Conditional Category NOTES>>	,
Conditional Category Negligible Minor Moderate Severe 440 - 80% of reach 800 - 80% of reach	IEL ALTERATION: Stream crossings, r
Negligible Minor Moderate Severe	
	Negligible
Channel Alteration Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines. If of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander guidelines. Greater than 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. AND/OR stream has been channelized, normal stable stream meander pattern has not recovered.	the st Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 0.93

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L_I X IF

INSERT PHOTOS:

(WSSI Photo Location L:\9999.01\mages\Stream Assessment\IMG_2733.jpg)



Looking east (upstream) at Stream Reach 87-A. The channel is often incised and much of the streambank is undercut. The left and right riparian buffers are covered by non-maintained herbaceous vegetation; a parking lot is adjacent to the right bank and sparse tree cover (<30% canopy cover) is present on the left bank. Instream habitat is present in less than 10% of the reach. A culvert is present at the upstream end of the reach, disrupting less than 20% of the reach.

DESCRIBE PROPOSED IMPAC	Γ:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 03/05/2019 87-B 119 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JF/JB/WN Tributary of Marrowbone Creek S-87: A5-9, B4-7 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 1.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 80% 20% 100% Right Bank 0.85 Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.37 Left Bank Lt Bank CI > 1.50 1.5 1.44 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

Stream Impact Assessment Form Page 2									
Project #	Project Name (Applicant)		Locality	Locality Cowardin Class.		Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connector (VDOT)		Henry	R4	03010103	03/05/2019	87-B	119	N/A
4. CHANNEI livestock	L ALTERATION: Stream crossi	ings, riprap, concr		concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, constr	rictions,
	ALTERATION: Stream crossi	ings, riprap, concr	Conditiona	al Category	traightening of ch		tion, embankmer		rictions,

stream has been

channelized, normal stable

stream meander

pattern has not

0.7

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

stream has been

channelized, normal stable

stream meande

pattern has not

alterations listed in the parameter guidelines.

1.1

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

unaltered pattern or has naturalized.

1.5

THE REACH CONDITION INDEX (RCI) >>

0.89

CI

1.50

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

80% of banks shored with gabion, riprap, or cement.

0.5

INSERT PHOTOS:

SCORE

(WSSI Photo Location L:\9999.01\Images\Stream Assessment\IMG_2733.jpg)

Iterations listed i

the parameter guidelines.

1.3



Looking east (upstream) at Stream Reach 87-B. The channel is deeply incised and flow is contained within the banks. The left bank riparian buffer is entirely forested with greater than 60% tree canopy cover; the right bank riparian buffer is largely forested with greater than 60% tree canopy cover and has some canopy gaps occupied by dense herbaceous vegetation and shrubs. Instream habitat elements are unstable and are present in less than 10% of the reach. This stream reach reach shows no signs of alteration.

)	E	SC	R	IBE	PR	ROF	209	SED	IMF	AC.	Γ:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 03/05/2019 87-C 78 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JF/JB/WN Tributary of Marrowbone Creek S-87: A1-5, B1-4 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 70% 30% 100% Right Bank Score > 0.6 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 0.87 Left Bank Lt Bank CI > 1.50 1.19 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

Stream Impact Assessment Form Page 2									
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	03/05/2019	87-C	78	N/A
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock Conditional Category NOTES>>									ictions,
	Negligible	Mir	nor		erate	Sev	/ere	NO I LO	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	of the channel	AU - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not	of the channel alterations listed in	Greater than 80% of by any of the chann	nei aiterations listed juidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.04 RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

1.50

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

SCORE

(WSSI Photo Location L:\9999.01\Images\Stream Assessment\IMG_2733.jpg)



Looking west (downstream) at Stream Reach 87-C. The stream banks are relatively stable and exhibit lower bank slopes than other reaches within this stream. The left bank riparian buffer is entirely forested with greater than 60% canopy cover. The right bank riparian buffer has a forested riparian buffer but is mostly comprised of maintained lawn. Instream habitat elements are present in less than 10% of the reach. There are no signs of channel alteration within this reach.

DESCRIBE	PROPOSED	IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 4/26/2019 87-D 12 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map JF Tributary of Marrowbone Creek S-87: ZF1-3, ZG1-3 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 1.60 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 85% 15% 100% Right Bank Score > 0.6 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 0.74 Left Bank Lt Bank CI > 1.50 1.12 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

Stream Impact Assessment Form Page 2									
Project #	Project Name (Applicant)		Locality Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor	
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	4/26/2019	87-D	12	N/A
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock									
			Condition	al Category				NOTES	
	Negligible	Mir	Conditiona	al Category	erate	Sev	vere	NOTES>>	

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

0.94

CI

1.50

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2) COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

INSERT PHOTOS:

SCORE

(WSSI Photo Location L:\9999.01\Images\Stream Assessment\IMG_2733.jpg)



Looking downstream at Stream Reach 87-D. The stream is mostly incised and likely to widen further. The left bank riparian buffer consists of mature forest with greater than 60% tree canopy cover. The right bank riparian buffer consists of mature forest with greater than 60% tree canopy cover and maintained lawn. Instream habitat is present in less than 10% of the stream. Channel alteration is not present in this reach.

DESCRIBE	PROPOSED	IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 2/27/2019 88-A 405 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-88: I1-17/F1-8/J1-9/K1-13 AO **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 98% 2% 100% Right Bank Score > 1.5 0.6 CI= (Sum % RA * Scores*0.01)/2 88% 10% 2% 100% Rt Bank CI > CI % Riparian Area> 1.48 Left Bank 0.6 0.85 Lt Bank CI > 1.40 1.5 1.44 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

Stream Impact Assessment Form Page 2										
Project #	Project Name (Applicant)		Locality Cowardin Class.	HUC Dat	Date	ate SAR # / Data Point	Impact / SAR length	Impact Factor		
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	2/27/2019	88-A	405	N/A	
4. CHANNEI ivestock	L ALTERATION: Stream cross	ings, riprap, conci	rete, gabions, or o	concrete blocks, s	traightening of cha	annel, channeliza	tion, embankmen	ts, spoil piles, consti	rictions,	
			Conditions	l Catagory				NOTEO		
	Negligible	Mir	Conditiona nor	al Category	erate	Sev		NOTES>>		
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chann	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

N/A

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 88-A. The reach was slightly incised with majority of banks stable. The right riparian buffer consisted of 98% mature forest cover and 2% herbaceous field. The left riparian buffer contained 88% mature forest cover, 2% non-maintained dense vegetation, and 10% herbaceous field. The in-stream habitat was suboptimal with stable elements in 30-50% of the reach, and the channel had no alterations.

DESCRIBE PROPOSED IMPACT:	DE	SCR	BE	PRO	POSED	IMPACT
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 03010103 2/27/2019 89-A 505 N/A Henry Stream Name and Information Name(s) of Evaluator(s) Stream Map S-89: M1-8/N1-3/L1-8 AO Marrowbone Creek 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) preser resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 95% 5% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank 0.6 Lt Bank CI > 1.46 1.5 1.48 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	2/27/2019	89-A	505	N/A
4. CHANNEI livestock	L ALTERATION: Stream cross	ings, riprap, conci		concrete blocks, s	traightening of ch	annel, channeliza	ition, embankmer	NOTES>>	rictions,
	Negligible	Mi	nor		erate	Sev	/ere	NOTES>>	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	is disrupted by any of the channel alterations listed in the parameter guidelines. If	of the channel	Greater than 80% of by any of the chang in the parameter of	of reach is disrupted nel alterations listed juidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 89-A. The reach had stable bed and banks with vegetative protection and some erosion. The right riparian buffer consisted of 100% mature forest cover. The left riparian buffer consisted of 95% mature forest cover and 5% sparsely vegetated area. The in-stream habitat was suboptimal with stable elements in 30-50% of the reach. There are no channel alterations within the evaluated reach.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 2/27/2019 90-A 273 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-90: Q1-20/R1-17/T24-29 AO **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 50% 50% 100% Right Bank Score > 1.5 1.1 CI= (Sum % RA * Scores*0.01)/2 75% 25% 100% Rt Bank CI > CI % Riparian Area> 1.30 Left Bank Lt Bank CI > 1.40 1.35 1.5 1.1 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	2/27/2019	90-A	273	N/A
4. CHANNEI livestock	L ALTERATION: Stream cross	ings, riprap, conci		concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,
			Contaitions						
	Negligible	Mi	nor		erate	Sev	/ere	NOTES	
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chang in the parameter of	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2) N/A

COMPENSATION REQUIREMENT (CR) >> CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 90-A. The reach had 40-60% vegetative protection on both banks with transient sediment. The right riparian buffer consisted of 50% mature forest cover and 50% mature forest cover with 30 to 60% canopy cover. The left buffer consisted of 75% mature forest cover and 25% mature forest cover with 30 to 60% canopy cover. In-stream habitat elements were lacking, and no channel alterations were observed.

DESCRIBE PROPOSED IMPACT:	DE	SCR	BE I	PRO	POSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 2/27/2019 90-B 174 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-90: Q20-31/T14-24 AO **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 75% 25% 100% Right Bank Score > 1.5 1.1 CI= (Sum % RA * Scores*0.01)/2 90% 10% 100% Rt Bank CI > CI % Riparian Area> 1.40 Left Bank Lt Bank CI > 1.46 1.5 1.1 1.43 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

Stream Impact Assessment Form Page 2									
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	2/27/2019	90-B	174	N/A
4. CHANNE livestock	L ALTERATION: Stream cross	ings, riprap, conci		concrete blocks, s	traightening of cha	annel, channeliza	tion, embankmer	nts, spoil piles, constr	ictions,
			Contaition	ai Category				INO LESSS	
	Negligible	Mir	nor	Mod	erate	Sev	/ere	NOTES>>	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chann	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 90-B. The reach had 40-60% vegetative protection on both banks with transient sediment and moderate erosion. The right riparian buffer consisted of 75% mature forest with 60% or grater can mature forest cover with 30 to 60% canopy cover. The left buffer consisted of 90% mature forest cover and 10% mature forest cover with 30 to 60% canopy cover. In-stream habitat elements were lacking, and no channel alterations were observed.

DESCRIBE	PROPOSED	IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 2/27/2019 90-C 217 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-90: Q31-36/T1-14/U1-10 AO **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 1.60 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 75% 25% 100% Right Bank Score > 1.5 1.1 CI= (Sum % RA * Scores*0.01)/2 80% 20% 100% Rt Bank CI > CI % Riparian Area> 1.40 Left Bank Lt Bank CI > 1.42 1.5 1.41 1.1 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	2/27/2019	90-C	217	N/A
4. CHANNEI ivestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of cha	annel, channeliza	tion, embankmer	nts, spoil piles, constr	rictions,
	Negligible	Mir		Mod	erate	Sev	rere	NOTES	
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chang in the parameter g	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,	1	

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 90-C. The reach had 40-60% vegetative protection on both banks with transient sediment and moderate erosion. The right riparian buffer consisted of 75% mature forest cover and 25% mature forest cover with 30 to 60% canopy cover. The left buffer consisted of 80% mature forest cover and 20% mature forest cover with 30 to 60% canopy cover. In-stream habitat elements were lacking, and no channel alterations were observed.

DESCRIBE PROPOSED IMPACT:	DE	SCR	BE I	PRO	POSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 03010103 2/27/2019 91-A 206 N/A Henry Stream Name and Information Name(s) of Evaluator(s) Stream Map S-91: W1-9/X1-7 AM Marrowbone Creek 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative Poor. Banks more stable than Severe or Poor due to lower bank slopes. Erosion may be present on 40-60% of rosion or unprotected banks. Majority f banks are stable (60-80%). aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 1.60 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 60% 40% 100% Right Bank Score > 1.5 0.5 CI= (Sum % RA * Scores*0.01)/2 60% 40% 100% Rt Bank CI > CI % Riparian Area> 1.10 Left Bank 0.5 Lt Bank CI > 1.10 1.10 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	нис	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	2/27/2019	91-A	206	N/A
4. CHANNEI livestock	L ALTERATION: Stream cross	sings, riprap, conci		concrete blocks, s	straightening of ch	annel, channeliza	ition, embankmer	nts, spoil piles, consti	rictions,
	Negligible	Mi	nor		lerate	Sev	/ere	NO I LOSS	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not	is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not	Greater than 80% of by any of the chang in the parameter g 80% of banks sh	of reach is disrupted nel alterations listed juidelines AND/OR ored with gabion, r cement.		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 0.90 RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

0.90

COMPENSATION REQUIREMENT (CR) >>

0.5

N/A CR = RCI X LF X IF

INSERT PHOTOS:

SCORE



Looking upstream at stream reach 91-A. The reach had eroded banks and was overwidended, with little vegetative protection present. The right and left riparian buffers consisted of 60% mature forest cover and 40% impervious surfaces associated with Soapstone Road. The in-stream habitat was suboptimal with stable elements in 30-50% of the reach, and channel alterations included road and brige installation.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 2/27/2019 92-A 119 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-92: Y1-7/V42-44/Z1-7 AO **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 95% 5% 100% Right Bank Score > 1.1 1.5 CI= (Sum % RA * Scores*0.01)/2 97% 3% 100% Rt Bank CI > CI % Riparian Area> 1.12 Left Bank Lt Bank CI > 1.20 1.16 1.2 1.1 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

Stream Impact Assessment Form Page 2									
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	2/27/2019	92-A	119	N/A
4. CHANNE livestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of cha	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,
	Negligible	Mir	nor		erate	Sev	/ere	NOTEOFF	
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chann	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 92-A. The reach had banks with little erosion and vegetative protection present. The right riparian buffer consisted of 5% mature forest cover and 95% mature forest with 30-60% canopy cover that lacked an understory. The left riparian buffer consisted of 97% mature forest with 30-60% canopy cover that lacked an understory, and 3% mature forest cover. The reach lacked in-stream habitat elements and did not have any channel alterations.

DESCRIBE	PROPOSED	IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 2/28/2019 92-B 141 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-92: V32-42 AO **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 98% 2% 100% Right Bank Score > 1.1 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.11 Left Bank Lt Bank CI > 1.50 1.30 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

0.50

Low

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	r (VDOT)	Henry	R4	03010103	2/28/2019	92-B	141	N/A
4. CHANNE ivestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of cha	annel, channeliza	tion, embankmer		ictions,
			Conditions	ai Calegoiy				NOTES>>	
	Negligible	Mir		Mod	erate	Sev	/ere	NOTES>>	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chanr in the parameter g	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 92-B. The reach had banks with moderate erosion and some vegetative protection present. The right riparian buffer consisted of 2% mature forest cover and 95% mature forest with 30-60% canopy cover that lacked an understory. The left buffer consisted of 100% mature forest cover. The reach lacked in-stream habitat elements and did not have any channel alterations.

DESCRIBE PROPOSED IMPACT:	DE	SCR	BE I	PRO	POSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 2/28/2019 92-C 495 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-92: AA5-16/AB5-8/V-32 AO **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.2 CI= (Sum % RA * Scores*0.01)/2 75% 25% 100% Rt Bank CI > CI % Riparian Area> 1.20 Left Bank Lt Bank CI > 0.75 0.98 0.5 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

0.50

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	2/28/2019	92-C	495	N/A
4. CHANNE livestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,
	Negligible	Mir			erate	Sev	/ere	NOTES>>	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in	20-40% of the stream reach is disrupted by any of the channel alterations listed in	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized.	is disrupted by any of the channel	80% of banks sh	nel alterations listed uidelines AND/OR ored with gabion,		
	urialitered pattern of has haturalized.	the parameter guidelines.	the parameter guidelines.	normal stable stream meander pattern has not recovered.	normal stable stream meander pattern has not recovered.	riprap, or	r cement.		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 92-C. The reach had moderate erosion along the banks with some vegetative protection present. The right riparian buffer consisted of 100% mature forest cover. The left buffer consisted of 25% mature forest cover and 75% impervious surface associated with Soapstone Road. The reach lacked in-stream habitat elements and did not have any channel alterations.

DESCRIBE	PROPOSED	IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 2/28/2019 92-D 138 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-92: AA1-5/AB1-5/W3/W4 AO **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 75% 20% 5% 100% Right Bank Score > 1.2 1.5 0.6 CI= (Sum % RA * Scores*0.01)/2 50% 50% 100% Rt Bank CI > CI % Riparian Area> 1.23 Left Bank Lt Bank CI > 1.00 1.12 0.5 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	2/28/2019	92-D	138	N/A
. CHANNE restock	L ALTERATION: Stream cross	ings, riprap, conci		concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, consti	rictions,
			Containone						
	Negligible	Mi	nor		erate	Sev	vere	NOTES>>	
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chant	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 92-D. The reach had banks with some erosion and vegetation present. The right riparian buffer consisted of 20% mature forest cover, 75% mature forest with 30-60% cover containing shrub and herb layers, and 5% impervious surface. The left buffer consisted of 50% mature forest cover and 50% impervious surface. The in-stream habitat was marginal with stable elements in 10-30% of the reach. Channel alterations include rip-rap throughout the length of the reach and culverts.

DESCRIBE PROPOS	SED IMPACT:
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Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC Date SAR# Class length Factor 30544.01 **Martinsville Connector (VDOT)** 03010103 2/27/2019 93-A 186 Henry R6 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map Unnamed Tributary to Marrowbone Creek S-93: V3-28 AO 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Marginal Suboptimal Poor Low Marginal: Non-maintained High Poor: ow Suboptimal High Suboptima Riparian areas awns, mowed Riparian areas High Marginal: lense herbaceou and maintained Low Poor: with tree stratum (dbh > 3 inches) vegetation, riparian areas with tree stratum (dbh > 3 inches) areas, nurseries Impervious ense herbaceou no-till cropland; surfaces, mine present, with vegetation with lacking shrub and Tree stratum (dbh > 3 inches) present resent, with 30% actively grazed spoil lands. either a shrub layer or a tree layer (dbh > 3 30% tree canop cover and a tree stratum, hay production, ponds Riparian with > 60% tree canopy cover and an non-maintained understory. Wetlands to 60% tree anopy cover an pasture, sparsely vegetated nonenuded surface **Buffers** row crops, active maintained open water. If containing both herbaceous and maintained area feed lots, trails, or inches) present, with <30% tree understory present, tree recently seeded other comparable Recent cutover stratum (dbh >3 shrub layers or a and stabilized, or conditions. (dense canopy cover. inches) present, with <30% tree non-maintained other comparable vegetation). understory condition. canopy cover wit maintained understory Low Low High High High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums descriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 100% 90% 10% Right Bank Score > 1.1 1.5 CI= (Sum % RA * Scores*0.01)/2 90% 10% CI % Riparian Area> Rt Bank CI > 1.14 Left Bank Score > 1.1 1.5 Lt Bank CI > 1.14 1.14 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.57 RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

N/A

INSERT PHOTOS:

Looking upstream at stream reach 93-A. The right and left riparian buffers consisted of 10% mature forest cover and 90% mature forest cover with 30 to 60% canopy cover.

Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC Date SAR# Class length Factor 30544.01 Martinsville Connector (VDOT) 03010103 2/28/2019 94-A Henry R6 83 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map Unnamed Tributary to Marrowbone Creek S-94: Z21-36 AO 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Marginal Suboptimal Poor Low Marginal: Non-maintained High Poor: ow Suboptimal High Suboptima Riparian areas awns, mowed Riparian areas High Marginal: lense herbaceou and maintained Low Poor: with tree stratum (dbh > 3 inches) vegetation, riparian areas with tree stratum (dbh > 3 inches) areas, nurseries Impervious ense herbaceou no-till cropland; surfaces, mine present, with vegetation with lacking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% actively grazed spoil lands. either a shrub layer or a tree layer (dbh > 3 30% tree canop cover and a tree stratum, hay production, ponds Riparian with > 60% tree canopy cover and an non-maintained understory. Wetlands to 60% tree anopy cover an pasture, sparsely vegetated nonenuded surface **Buffers** row crops, active maintained open water. If containing both herbaceous and maintained area feed lots, trails, or inches) present, with <30% tree understory present tree recently seeded other comparable Recent cutover stratum (dbh >3 shrub layers or a and stabilized, or conditions. (dense canopy cover. inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover with maintained understory Low Low High High High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums descriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 75% CI % Riparian Area> 25% 100% Rt Bank CI > 1.50 Left Bank Score > 1.5 0.5 Lt Bank CI > 1.25 1.38 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.69 RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

N/A

INSERT PHOTOS:



Looking upstream at stream reach 94-A. The right riparian buffer consisted of 100% mature forest cover. The left riparian buffer consisted of 75% mature forest cover and 25% impervious surfaces associated with Soapstone Road.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 2/28/2019 94-B 15 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-94: Z20-Z21 AO **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.1 CI= (Sum % RA * Scores*0.01)/2 75% 25% 100% Rt Bank CI > CI % Riparian Area> 1.10 Left Bank 0.5 Lt Bank CI > 1.25 1.18 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

0.50

Low

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	нис	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	2/28/2019	94-B	15	N/A
4. CHANNE	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of cha	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,
	Nealiaible	Mir	nor		erate	Sev	vere	NOTES>>	
Channel Alteration	Negligible Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chann	nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking downstream at stream reach 94-B. The reach had banks with moderate erosion and some vegetative protection present. The right riparian buffer consisted of 100% mature forest with 30-60% canopy cover. The left riparian buffer consisted of 75% mature forest cover and 25% impervious surfaces associated with Soapstone Road. The reach lacked instream habitat elements and did not have any channel alterations.

DESCRIBE PROPOSED IMPACT:	DE	SCR	BE I	PRO	POSED	IMPACT:
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Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC Date SAR# Class length Factor 30544.01 Martinsville Connector (VDOT) 03010103 2/28/2019 95-A Henry R6 30 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map Unnamed Tributary to Marrowbone Creek S-95: AI1-3 AO 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Marginal Suboptimal Poor Low Marginal: Non-maintained High Poor: ow Suboptimal ligh Suboptima Riparian areas awns, mowed Riparian areas High Marginal: lense herbaceo and maintained Low Poor: with tree stratum (dbh > 3 inches) vegetation, riparian areas with tree stratum (dbh > 3 inches) areas, nurseries Impervious ense herbaceou no-till cropland; surfaces, mine present, with vegetation with lacking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% actively grazed spoil lands. either a shrub layer or a tree layer (dbh > 3 30% tree canop cover and a tree stratum, hay production, ponds Riparian with > 60% tree canopy cover and an non-maintained understory. Wetlands to 60% tree anopy cover an pasture, sparsely vegetated nonenuded surface **Buffers** row crops, active maintained open water. If containing both herbaceous and maintained area feed lots, trails, or inches) present, with <30% tree understory present tree recently seeded other comparable Recent cutover stratum (dbh >3 shrub layers or a and stabilized, or conditions. (dense canopy cover. inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover with maintained understory Low Low High High High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums descriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 95% 100% 5% Right Bank Score > 1.5 0.6 CI= (Sum % RA * Scores*0.01)/2 100% CI % Riparian Area> Rt Bank CI > 1.46 Left Bank Score > 1.5 Lt Bank CI > 1.50 1.48 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.74 RCI= (Riparian CI)/2

INSERT PHOTOS:



COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

N/A

Looking upstream at stream reach 95-A. The right riparian buffer consisted of 95% mature forest cover and 5% sparse herbaceous vegetation. The left riparian buffer consisted of 100% mature forest cover.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 2/28/2019 96-A 469 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-96: AH21-80 AW **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.50

High

Score

1.5

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	2/28/2019	96-A	469	N/A
4. CHANNEI livestock	L ALTERATION: Stream cross	sings, riprap, concr		concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,
	Negligible	Mir	nor		erate	Sev	/ere	NOTES>>	
Channel	_	Less than 20% of	20-40% of the	is disrupted by any of the channel	of the channel				
Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	of the channel	the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.		nel alterations listed uidelines AND/OR ored with gabion,		

THE REACH CONDITION INDEX (RCI) >>

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2) N/A

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 96-A. The reach had moderately incised banks with little vegetative protection. The right and left riparian buffers consisted of 100% mature forested cover. The in-stream habitat contained leaf packs, undercut banks, woody debris and shade. No channel alteration in reach.

DESCRIBE	PROPOSED	IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 2/28/2019 97-A 239 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-97: AH1-16/AG1-15 AM **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 3.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	2/28/2019	97-A	239	N/A
4. CHANNEL livestock	_ ALTERATION: Stream cross	ings, riprap, conci	rete, gabions, or o	concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmen	nts, spoil piles, const	rictions,
			Conditions	ol Cotogony				NOTEO	
	Negligible	Mir	Conditiona nor	al Category	erate	Sev	rere	NOTES>>	
Channel Alteration	Negligible Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mod 40 - 60% of reach is disrupted by any of the channel	60 - 80% of reach	Greater than 80% c by any of the chanr in the parameter g 80% of banks sh riprap, or	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 97-A. The reach had stable banks with little erosion. The right and left riparian buffers consisted of 100% mature forest cover containing wetlands. The in-stream habitat was suboptimal with stable elements in 30-50% of the reach, including contained leaf packs and woody debris. The reach lacked channel alterations.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 2/28/2019 97-B 77 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-97: AH16-21/AG15-17 AM **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.50

High

Score

1.5

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	нис	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connector (VDOT) Ho			R3	03010103	2/28/2019	97-B	77	N/A
1. CHANNEL ivestock	L ALTERATION: Stream cross	ings, riprap, conci			traightening of cha	annel, channeliza	tion, embankmer		rictions,
	Negligible	Mi		al Category	erate	Sev	/ere	NOTES>>	
Channel Alteration	Negligible Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is	Mod 40 - 60% of reach is disrupted by any of the channel	of the channel alterations listed in	Greater than 80% of by any of the chanr in the parameter g	nel alterations listed uidelines AND/OR		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 97-B. The reach was slightly incised with few areas of erosion. The right and left riparian buffers consisted of 100% mature forest cover. The in-stream habitat contained leaf packs, root wads, woody debris and varied substrate sizes. The reach lacked channel alterations.

DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 2/28/2019 97-C 545 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-97: AG17-46/AH80-91/AF AO **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. 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Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

Stream Impact Assessment Form Page 2										
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor	
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	2/28/2019	97-C	545	N/A	
4. CHANNE ivestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, consti	rictions,	
	Negligible	nor	Mod		Severe		NO I LOSS			
		14111	1101	IVIOU	erate	Sev	/ere			
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chang in the parameter of	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,	1		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 97-C. The reach had incised banks with some active erosion. The right and left riparian buffers consisted of 100% mature forest cover. The in-stream habitat was suboptimal with stable elements in 30-50% of the reach. The reach lacked channel alterations.

DESCRIBE PROPOSED IMPACT:	DE	SCR	BE	PRO	POSED	IMPACT
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 2/28/2019 97-D 68 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-97: AG46-50/AJ2-6 AO **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.50

High

Score

1.5

Stream Impact Assessment Form Page 2										
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor	
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	2/28/2019	97-D	68	N/A	
4. CHANNEL	L ALTERATION: Stream cross	ings, riprap, concr	rete, gabions, or o	concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer	ts, spoil piles, consti	rictions,	
				al Category				NOTES>>		
	Negligible	Mir	Conditiona	Mode	erate	Sev	/ere	NOTES>>		
Channel Alteration	Negligible Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the	Mode 40 - 60% of reach is disrupted by any of the channel	60 - 80% of reach is disrupted by any of the channel alterations listed in		of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,			

THE REACH CONDITION INDEX (RCI) >>

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 97-D. The reach was slightly incised with few areas of erosion. The right and left riparian buffers consisted of 100% mature forest cover. The in-stream habitat was optimal with stable elements in greather than 50% of the reach, including varied water velocity and depths, riffle pool complexes and varied substrate sizes. The reach lacked channel alterations.

Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC Date SAR# Class length Factor 30544.01 Martinsville Connector (VDOT) 03010103 2/28/2019 98-A N/A Henry R6 26 Name(s) of Evaluator(s) Stream Name and Information Stream Map Unnamed Tributary to Marrowbone Creek S-98: AL1-4/AM1-4 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Marginal Suboptimal Poor Low Marginal: Non-maintained High Poor: ow Suboptimal ligh Suboptima Riparian areas awns, mowed Riparian areas High Marginal: lense herbaceou and maintained Low Poor: with tree stratum (dbh > 3 inches) vegetation, riparian areas with tree stratum (dbh > 3 inches) areas, nurseries Impervious ense herbaceou no-till cropland; surfaces, mine present, with vegetation with lacking shrub and Tree stratum (dbh > 3 inches) present resent, with 30% actively grazed spoil lands. either a shrub layer or a tree layer (dbh > 3 30% tree canop cover and a tree stratum, hay production, ponds Riparian with > 60% tree canopy cover and an non-maintained understory. Wetlands to 60% tree anopy cover an pasture, sparsely vegetated nonenuded surface **Buffers** row crops, active maintained open water. If containing both herbaceous and maintained area feed lots, trails, or inches) present, with <30% tree understory present tree recently seeded other comparable Recent cutover stratum (dbh >3 shrub layers or a and stabilized, or conditions. (dense canopy cover. inches) present, with <30% tree non-maintained other comparable vegetation). understory condition. canopy cover with maintained understory Low Low High High High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums descriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% CI % Riparian Area> Rt Bank CI > 1.50 Left Bank Score > 1.5 Lt Bank CI > 1.50 1.50 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.75 RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

N/A

INSERT PHOTOS:



Looking upstream at stream reach 98-A. The right and left riparian buffer consisted of 100% mature forested cover.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 2/28/2019 98-B 308 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-98: AL4-26/AM4-19 AM **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

Stream Impact Assessment Form Page 2										
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor	
30544.01	Martinsville Connecto	Henry	R4	03010103	2/28/2019	98-B	308	N/A		
4. CHANNEL livestock	L ALTERATION: Stream cross	ings, riprap, conci		concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,	
	Negligible	Minor		Moderate		Severe		11012022		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	is disrupted by any of the channel alterations listed in the parameter guidelines. If	of the channel alterations listed in	by any of the chan	nel alterations listed uidelines AND/OR ored with gabion,			
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 98-B. The reach moderate areas of erosion. The right and left riparian buffers consisted of 100% mature forest cover. The reach lacked in-stream habitat elements and did not have any channel alterations.

DESCRIBE PROPOSED IMPACT:

Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC Date SAR# Class length Factor 30544.01 Martinsville Connector (VDOT) 03010103 2/28/2019 99-A N/A Henry R6 53 Name(s) of Evaluator(s) Stream Name and Information Stream Map ΑO Unnamed Tributary to Marrowbone Creek S-99: AP1-4/AQ1-4 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Marginal Suboptimal Poor Low Marginal: Non-maintained High Poor: ow Suboptimal High Suboptima Riparian areas awns, mowed Riparian areas High Marginal: lense herbaceou and maintained Low Poor: with tree stratum (dbh > 3 inches) vegetation, riparian areas with tree stratum (dbh > 3 inches) areas, nurseries Impervious ense herbaceou no-till cropland; surfaces, mine present, with vegetation with lacking shrub and Tree stratum (dbh > 3 inches) present resent, with 30% actively grazed spoil lands. either a shrub layer or a tree layer (dbh > 3 30% tree canop cover and a tree stratum, hay production, ponds Riparian with > 60% tree canopy cover and an non-maintained understory. Wetlands to 60% tree anopy cover an pasture, sparsely vegetated nonenuded surface **Buffers** row crops, active maintained open water. If areas containing both herbaceous and maintained area feed lots, trails, or inches) present, with <30% tree understory present, tree recently seeded other comparable Recent cutover stratum (dbh >3 shrub layers or a and stabilized, or conditions. (dense canopy cover. inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover with maintained understory Low Low High High High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums descriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% CI % Riparian Area> 100% Rt Bank CI > 1.50 Left Bank Score > 1.5 Lt Bank CI > 1.50 1.50 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.75 RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

N/A

INSERT PHOTOS:



Looking upstream at stream reach 99-A. The right and left riparian buffers consisted of 100% mature forest cover.

Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC Date SAR# Class length Factor 30544.01 Martinsville Connector (VDOT) 03010103 2/28/2019 99-B 330 Henry R6 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map ΑO Unnamed Tributary to Marrowbone Creek S-99: AQ9-10/AP9-11/AN1 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Marginal Suboptimal Poor Low Marginal: Non-maintained High Poor: ow Suboptimal High Suboptima Riparian areas awns, mowed Riparian areas High Marginal: lense herbaceou and maintained Low Poor: with tree stratum (dbh > 3 inches) vegetation, riparian areas with tree stratum (dbh > 3 inches) areas, nurseries Impervious ense herbaceou no-till cropland; surfaces, mine present, with vegetation with lacking shrub and Tree stratum (dbh > 3 inches) present resent, with 30% actively grazed spoil lands. either a shrub layer or a tree layer (dbh > 3 30% tree canop cover and a tree stratum, hay production, ponds Riparian with > 60% tree canopy cover and an non-maintained understory. Wetlands to 60% tree anopy cover an pasture, sparsely vegetated nonenuded surface **Buffers** row crops, active maintained open water. If containing both herbaceous and shrub layers or a maintained area feed lots, trails, or inches) present, with <30% tree understory present tree recently seeded other comparable Recent cutover stratum (dbh >3 and stabilized, or conditions. (dense canopy cover. inches) present, with <30% tree non-maintained other comparable vegetation). understory condition. canopy cover with maintained understory Low High Low High High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums descriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% CI % Riparian Area> Rt Bank CI > 1.50 Left Bank Score > 1.5 Lt Bank CI > 1.50 1.50 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.75 RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

N/A

INSERT PHOTOS:



Looking upstream at stream reach 99-B. The right and left riparian buffers consisted of 100% mature forest cover.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 2/28/2019 100-A 258 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-100: AR15-20/AU16-20/A AM **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

0.90

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	r (VDOT)	Henry	R3	03010103	2/28/2019	100-A	258	N/A
4. CHANNE livestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of cha	annel, channeliza	tion, embankmer	nts, spoil piles, consti	rictions,
	Negligible	Mir			erate	Sev	/ere	NOTES>>	
Channel		Less than 20% of	20-40% of the	40 - 60% of reach is disrupted by any of the channel					
Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	alterations listed in		nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 100-A. The reach had slightly incised banks with vegetative protection present. The right and left riparian buffers consisted of 100% mature forest cover containing wetlands. The in-stream habitat was marginal with stable elements in 10-30% of the reach. No channel alterations were observed.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 2/28/2019 100-B 278 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-100: AR1-15/AU1-16 AM **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 100-B. The reach had unstable, eroded banks and a cobble substrate. The right and left riparian buffers consisted of 100% mature forest cover with wetlands. The in-stream habitat contained undercut banks, woody debris and various substrate sizes. No channel alterations were observed.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 3/1/2019 101-A 237 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-101: BA1-21/AZ15/BB1-AW **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

Project # Project Name (Applicant) Locality Cowardin Class. HUC Date SAR # / Data Point length Factor 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 3/1/2019 101-A 237 N/A 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock Conditional Category Negligible Minor Moderate Severe Sev		St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock Conditional Category	Project #	Project Name (App	olicant)	Locality		HUC	Date		•	-
Channel Alteration Negligible Minor Moderate Severe	30544.01	Martinsville Connecto	Henry	R3	03010103	3/1/2019	101-A	237	N/A	
Channel Alteration Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Channelization and the parameter guidelines. Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not pattern ha		L ALTERATION: Stream cross	sings, riprap, conci			traightening of ch	annel, channeliza	ition, embankmer		rictions,
Channel Alteration Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not part of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not part of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not part of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not part of the channel alterations listed in the parameter guidelines. If stream has bee		Negligible	Mir			erate	Sev	/ere	NOTES>>	
		Channelization, dredging, alteration, or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable	Greater than 80% of by any of the chan in the parameter g	of reach is disrupted nel alterations listed juidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 101-A. The reach had erosion on the banks with moderate vegetative protection present. The right and left riparian buffers consisted of 100% mature forest cover. The in-stream habitat was suboptimal with stable elements in 30-50% of the reach. No channel alterations were observed.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 3/1/2019 101-B 232 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-101: AY1-20/BB21/AZ1-1 AM **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 3.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	нис	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/1/2019	101-B	232	N/A
4. CHANNEI livestock	L ALTERATION: Stream cross	ings, riprap, conci	rete, gabions, or o		traightening of cha	annel, channeliza	ation, embankmer		rictions,
								INOTES	
	Negligible	Mi	nor		erate	Se	vere	NOTES>>	
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	is disrupted by any of the channel alterations listed in	Greater than 80% by any of the chan in the parameter g			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 101-B. The reach had little incision and vegetative protection present. The right and left riparian buffers consisted of 100% mature forest cover. The in-stream habitat contained root wads and leaf packs. No channel alterations were observed.

Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia

For use in ephemeral streams

Project #	Project Name	•	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R6	03010103	3/1/2019	102-A	271	N/A
Name	e(s) of Evaluator(s)	Stream Name	e and Informa	ation				Stream Map	

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

Unnamed Tributary to Matrimony Creek

		Con	ditional Cate	gory			
	Optimal	Subo	ptimal	Mar	ginal	Po	oor
Riparian Buffers	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an non-maintained understory. Wetlands areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition	Low Poor: Impervious surfaces, minds, spoil lands, denuded surfaces row crops, active feed lots, trails, o other comparable conditions.
		High	Low	High	Low	High	Low
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5

1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.

descriptors.

2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.

3. Enter the % Riparian Area and Score for each riparian category in the blocks below.

ΑO

Score > 1.5

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

100%

% Riparian Area>

THE REACH CONDITION INDEX (RCI) >> 0.75

Rt Bank CI >

Lt Bank CI >

CI= (Sum % RA * Scores*0.01)/2

1.50

1.50

CI

1.50

S-102: BD1-17/BC1-14

NOTES>>

RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

Ensure the sums

of % Riparian

Blocks equal 100

100%

100%

INSERT PHOTOS:

Left Bank



Looking upstream at stream reach 102-A. The right and left riparian buffers consisted of 100% mature forest cover.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 3/1/2019 102-B 109 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-102: BD17-24/BC14-21 AO **Unnamed Tributary to to Matrimony Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

0.90

High

Score

1.5

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	Henry	R4	03010103	3/1/2019	102-B	109	N/A	
4. CHANNE livestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of cha	annel, channeliza	ition, embankmei	nts, spoil piles, constr	rictions,
	Negligible	Mir		Mod	erate	Sev	vere	NO 120	
Channel		Less than 20% of the stream reach			is disrupted by any of the channel alterations listed in	Greater than 80% of	of roach is distributed		
Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	is disrupted by any of the channel alterations listed in the parameter guidelines.	disrupted by any of the channel alterations listed in the parameter guidelines.	guidelines. If	the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	in the parameter g 80% of banks sh	nreadins distributed in the latterations listed juidelines AND/OR lored with gabion, r cement.		

THE REACH CONDITION INDEX (RCI) >>

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 102-B. The reach had slightly eroded banks with vegetative protection present. The right and left riparian buffers consisted of 100% mature forest cover. The in-stream habitat was marginal and contained leaf packs. No channel alterations were observed.

Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact SAR # Project # **Project Name** Locality HUC Date Class length Factor 30544.01 Martinsville Connector (VDOT) 03010103 3/1/2019 103-A 50 Henry R6 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map ΑO Unnamed Tributary to Marrowbone Creek S-103: BD13/BD14/BK1-1 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Marginal Suboptimal Poor Low Marginal: Non-maintained High Poor: ow Suboptimal High Suboptima Riparian areas awns, mowed Riparian areas High Marginal: lense herbaceou and maintained Low Poor: with tree stratum (dbh > 3 inches) vegetation, riparian areas with tree stratum (dbh > 3 inches) areas, nurseries Impervious ense herbaceou no-till cropland; surfaces, mine present, with vegetation with lacking shrub and Tree stratum (dbh > 3 inches) present resent, with 30% actively grazed spoil lands. either a shrub layer or a tree layer (dbh > 3 30% tree canop cover and a tree stratum, hay production, ponds Riparian with > 60% tree canopy cover and an non-maintained understory. Wetlands to 60% tree anopy cover an pasture, sparsely vegetated nonenuded surface **Buffers** row crops, active maintained open water. If areas containing both herbaceous and maintained area feed lots, trails, or inches) present, with <30% tree understory present tree recently seeded other comparable Recent cutover stratum (dbh >3 shrub layers or a and stabilized, or conditions. (dense canopy cover. inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover with maintained understory Low Low High High High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums descriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below. Blocks equal 100 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% CI % Riparian Area> Rt Bank CI > 1.50 Left Bank Score > 1.5 Lt Bank CI > 1.50 1.50 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.75 RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

N/A

INSERT PHOTOS:



Looking upstream at stream reach 103-A. The right and left riparian buffers consisted of 100% mature forest cover.

Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact SAR # Project # **Project Name** Locality HUC Date Class length Factor 30544.01 Martinsville Connector (VDOT) 03010103 3/1/2019 104-A 119 N/A Henry R6 Name(s) of Evaluator(s) Stream Name and Information Stream Map ΑO Unnamed Tributary to Marrowbone Creek S-104: BI1-5/BJ1-6 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Marginal Suboptimal Poor Low Marginal: Non-maintained High Poor: ow Suboptimal High Suboptima Riparian areas awns, mowed Riparian areas High Marginal: lense herbaceou and maintained Low Poor: with tree stratum (dbh > 3 inches) vegetation, riparian areas with tree stratum (dbh > 3 inches) areas, nurseries Impervious ense herbaceou no-till cropland; surfaces, mine present, with vegetation with lacking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% actively grazed spoil lands. either a shrub layer or a tree layer (dbh > 3 30% tree canop cover and a tree stratum, hay production, ponds Riparian with > 60% tree canopy cover and an non-maintained understory. Wetlands to 60% tree anopy cover an pasture, sparsely vegetated nonenuded surface **Buffers** row crops, active maintained open water. If containing both herbaceous and shrub layers or a maintained area feed lots, trails, or inches) present, with <30% tree understory present tree recently seeded other comparable Recent cutover stratum (dbh >3 and stabilized, or conditions. (dense canopy cover. inches) present, with <30% tree non-maintained other comparable vegetation). understory condition. canopy cover with maintained understory Low High High Low High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums descriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below. Blocks equal 100 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% CI % Riparian Area> Rt Bank CI > 1.50 Left Bank Score > 1.5 Lt Bank CI > 1.50 1.50 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.75 RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

N/A

INSERT PHOTOS:



Looking upstream at stream reach 104-A. The right and left riparian buffers consisted of 100% mature forest cover.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 3/1/2019 105-A 457 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-105: BE1-39/BF1-37 AM **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 5% 95% 100% Right Bank Score > 1.5 0.5 CI= (Sum % RA * Scores*0.01)/2 10% 90% 100% Rt Bank CI > CI % Riparian Area> 0.55 Left Bank Lt Bank CI > 0.60 0.58 1.5 0.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/1/2019	105-A	457	N/A
4. CHANNE ivestock	L ALTERATION: Stream cross	ings, riprap, concr		al Category	traightening of ch	annel, channeliza	tion, embankmer		ictions,
			Containon	ai Category				NOTES>>	
	Negligible	Mir	nor	Mod	erate	Se	/ere	NOTES>>	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chan in the parameter g			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 21-A. The reach had incised, eroding banks with some vegetative protection present. The right riparian buffer consisted of 5% mature forest cover, and 95% denuded land from logging. The left riparian buffer consisted of 90% denuded land from logging, and 10% PSS wetland. The in-stream habitat was poor with stable elements in less than 10% of the reach. Channel alterations include fill at the top of the stream deposited to construct a logging road.

)	E	SC	R	IBE	PR	ROF	209	SED	IMF	AC.	Γ:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 3/1/2019 106-A 651 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-106: BO1-35/BN1-33 AM **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 25% 5% 70% 100% Right Bank 0.85 0.5 Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 20% 10% 70% 100% Rt Bank CI > CI % Riparian Area> 0.77 Left Bank 0.85 0.5 Lt Bank CI > 0.74 0.75 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	olicant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/1/2019	106-A	651	N/A
4. CHANNE livestock	L ALTERATION: Stream cross	sings, riprap, concr			traightening of cha	annel, channeliza	tion, embankmer		rictions,
	Negligible	Mir		al Category	erate	Sou	/ere	NOTES>>	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in	20-40% of the	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been	Greater than 80% of by any of the chant	of reach is disrupted nel alterations listed uidelines AND/OR		
	unantered pattern of has flaturalized.	the parameter guidelines.	the parameter guidelines.	channelized, normal stable stream meander pattern has not recovered.	channelized, normal stable stream meander pattern has not recovered.	riprap, o			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking downstream at stream reach 106-A. The reach was incised with some erosion and vegetative protection present. The right riparian buffer consisted of 25% mature forest cover, 5% maintained vegetation, and 70% denuded clear cut land. The left riparian buffer contained 20% mature forest cover, 10% maintained vegetation, and 70% denuded clear cut land. The in-stream habitat was marginal with stable elements in 10-30% of the reach, including cobbles, undercut banks and shade. No channel alterations were observed.

)	E	SC	R	IBE	PR	ROF	209	SED	IMF	AC.	Γ:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 3/1/2019 107-A 308 N/A Stream Name and Information Stream Map S-107: AT1-8, AS1-8, Name(s) of Evaluator(s) AM **Unnamed Tributary to Marrowbone Creek** BH1-9, BQ1-9 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR naiority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 1.60 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 0.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 0.50 Left Bank Lt Bank CI > 0.50 0.50 0.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/1/2019	107-A	308	N/A
4. CHANNEL livestock	L ALTERATION: Stream cross	ings, riprap, conci	rete, gabions, or o		traightening of cha	annel, channeliza	ation, embankmer		ictions,
	Negligible	Mi	nor		erate	Sev	vere	NOTES>>	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chan in the parameter g			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking downstream at Stream Reach 107-A. The reach was overwidended and incised with unstable banks. The right and left riparian buffer consisted of 100% poor canopy cover and had denuded surfaces due to logging activity. There is less than 10% in-stream habitat present within this reach. There are no channel alterations.

DESCRIBE PROPOSED IMPACT:	DE	SCR	BE I	PRO	POSED	IMPACT:
---------------------------	----	-----	------	-----	-------	---------

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 3/1/2019 108-A 230 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-108: BR1-13/BS1-14 AW **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe or Very little incision or active erosion: 8 ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative Poor. Banks more stable than Severe or Poor due to lower bank slopes. Erosion may be present on 40-60% of rosion or unprotected banks. Majority f banks are stable (60-80%). aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR naiority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present, AND/OR V AND/OR V-shaped channels have than 80% of stream bed is covered by shaped channels have vegetative protection on > 40% of the banks and vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 1.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Suboptimal Poor Optimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 20% 75% 5% 100% Right Bank 0.5 Score > 1.5 0.75 CI= (Sum % RA * Scores*0.01)/2 5% 20% 75% 100% Rt Bank CI > 0.89 CI % Riparian Area> Left Bank 0.5 Lt Bank CI > 0.67 0.78 1.5 1.1 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat in greater than 50% of the reach. Cover are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/1/2019	108-A	230	N/A
4. CHANNE ivestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of cha	annel, channeliza	tion, embankmer		ictions,
			Contaitions	ai Calegory				INUTES>>	
	Negligible	Mir	nor		erate	Sev	/ere	NOTES>>	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chan in the parameter g			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 108-A. The reach severly incised and unstable banks. The right riparian buffer consisted of 20% mature tree cover, 75% herbaceous vegetation, and 5% lack of vegetation. The left buffer contained 5% mature tree cover, 20% mature tree cover with no understory, and 75% logged land. The in-stream habitat was suboptimal with stable elements in 30-50% of the reach. No channel alterations were observed.

DESCRIBE	PROPOSED	IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 02070010 3/02/2019 108-A 1,635 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JB/ WN/ JF **Unnamed Tributary to Marrowbone Creek** S-108: AL1-68, AM1-68 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 60% 40% 100% Right Bank Score > 1.5 1.1 CI= (Sum % RA * Scores*0.01)/2 90% 10% 100% Rt Bank CI > CI % Riparian Area> 1.34 Left Bank 0.5 Lt Bank CI > 1.40 1.37 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, stock CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, stock Conditional Category Negligible Minor Moderate Severe Iteration Channelization, dredging, alteration, or hardening absent. Stream has an unpliced patters by literations listed in the parameter guidelines. If stream has been stream or has been stream as a parameter guidelines. If stream has been st		S	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, stock Conditional Category	Project #	Project Name (App	olicant)	Locality		HUC	Date			Impact Factor
Conditional Category Notes Notes	30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	02070010	3/02/2019	108-A	1,635	N/A
Negligible Minor Moderate Severe 40 - 60% of reach is disrupted by any of the channel alteration. Channelization, dredging, alteration, its disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been until the parameter guidelines. If stream has been seen stream has been stream	CHANNE estock	L ALTERATION: Stream cross	sings, riprap, concr			traightening of ch	annel, channeliza	tion, embankmer		ictions,
Less than 20% of the stream reach is disrupted by any of the channel alteration. Channelization, dredging, alteration, or hardening absent. Stream has an unaltered cetters or the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been stream and the channel alterations listed in the parameter guidelines. If stream has been stream has be		Negligible	Mir			erate	Se	/ere	NOTES>>	
the parameter guidelines. the parameter guidelines. guidelines. the parameter guidelines. guidelines. channelized, normal stable stream meander pattern has not recovered. recovered. channelized, normal stable stream meander pattern has not recovered.	Channel	or hardening absent. Stream has an	the stream reach is disrupted by any of the channel	20-40% of the stream reach is disrupted by any of the channel	is disrupted by any of the channel alterations listed in the parameter guidelines. If	is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized,	Greater than 80% of by any of the chan in the parameter g 80% of banks sh	nei aiterations listed juidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



Looking upstream at Stream Reach 108-A. The reach was incised with areas of active erosion. The right riparian buffer consisted of 60% of canopy cover and 40% of marginal canopy cover that had a non-maintained herbaceous cover with denuded surfaces due to logging activity. The left riparian buffer consisted of 90% canopy cover and 10% of poor canopy cover with denuded surfaces due to logging activity. The instream habitat consisted of riffles, pools, leaf packs and substrate of various particle size but had excess sediment and silt due to active erosion. There reach had no channel

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 02070010 3/02/2019 108-B 651 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JB/ WN/ JF S-108: AL68-89, AM68-92 **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. 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Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 10% 90% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank 0.75 Lt Bank CI > 0.83 1.16 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	02070010	3/02/2019	108-B	651	N/A
4. CHANNEl livestock	L ALTERATION: Stream cross	ings, riprap, concr			traightening of cha	annel, channeliza	tion, embankmer		rictions,
				al Category				NOTES>>	
	Negligible	Mir	nor		erate	Sev	ere		
				40 - 60% of reach					
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	of the channel		by any of the chanr	nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

CR = RCI X LF X IF

COMPENSATION REQUIREMENT (CR) >>

N/A

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



Looking consisted of 100% optimal canopy cover. The left riparian buffer consisted of 10% optimal canopy cover and 90% non-maintaned herbaceous ground cover with marginal canopy cover due to recent logging activity. The instream habitat consisted of riffles, pools, leaf packs and substrate of various particle size but had excess sediment and siltdue to active erosion. The reach had no channel alterations.

DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 3/2/2019 109-A 18 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-109: BY1-3/BX1-3 AM **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 80% 20% 100% Right Bank Score > 1.2 0.75 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.11 Left Bank Lt Bank CI > 1.20 1.16 1.2 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	olicant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/2/2019	109-A	18	N/A
4. CHANNE livestock	L ALTERATION: Stream cross	sings, riprap, concr		concrete blocks, s	traightening of cha	annel, channeliza	ation, embankmer	nts, spoil piles, const	rictions,
	Negligible	Mir	nor		erate	Sev	vere	1401232	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is	is disrupted by any of the channel alterations listed in the parameter guidelines. If	of the channel alterations listed in	Greater than 80% of by any of the chan in the parameter g		I	

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 109-A. The reach had stable banks with little erosion. The right riparian buffer consisted of 80% mature forest cover with 30-60% canopy cover and a non-maintained understory, and 20% dense herbaceous vegetation. The left buffer contains 100% mature forest cover with 30-60% canopy cover and a non-maintained understory. The in-stream habitat contained varied substrate sizes and leaf packs. No channel alterations were observed.

DESCRIBE	PROPOSED	IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 3/2/2019 109-B 40 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-109: BY3-8/BX3-8 AW **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank 0.75 Score > CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 0.75 Left Bank 0.75 Lt Bank CI > 0.75 0.75 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

0.90

High

Score

1.5

Stream Impact Assessment Form Page 2									
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/2/2019	109-B	40	N/A
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock									
	Conditional Category				NOTES>>				
	Negligible	Minor		Moderate		Severe			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the parameter guidelines. If	of the channel alterations listed in	by any of the chan in the parameter of 80% of banks sh	of reach is disrupted nel alterations listed juidelines AND/OR ored with gabion, r cement.	d	
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		
REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH									

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 109-B. The reach had eroded banks with vegetative protection present. The right and left riparian buffers consisted of 100% dense herbaceous vegetation with <30% canopy cover. The in-stream habitat was marginal with stable elements in 10-30% of the reach. No channel alterations were observed. This reach was within a maintained utility right of way.

DESCRIBE PROPOSED IMPACT:	DE	SCR	ΒE	PRO	POSED	IMPACT
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 3/2/2019 109-C 479 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-109: BY8-31/BX8-31/CA AW **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR naiority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 1.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 10% 20% 70% 100% Right Bank 0.85 Score > 0.5 1.1 CI= (Sum % RA * Scores*0.01)/2 20% 80% 100% Rt Bank CI > CI % Riparian Area> 0.87 Left Bank Lt Bank CI > 1.42 1.14 1.5 1.1 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 109-C. The reach has deeply incised, unstable banks. The right riparian buffer consisted of 70% dense shrub and herbaceous vegetation, 20% mature forest cover with 30-60% canopy cover, and 10% logged land. The left buffer contained 20% mature forest cover with 30-60% canopy cover and 80% mature forest cover. The in-stream habitat was marginal with stable elements in 10-30% of the reach. Channel alterations include a spoil pile at the headwaters from logging activities.

DESCRIBE	PROPOSED	IMPACT:

Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC Date SAR# Class length Factor 30544.01 **Martinsville Connector (VDOT)** 03010103 3/2/2019 109-D Henry R6 37 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map Unnamed Tributary to Marrowbone Creek S-109:BZ1-3/CA1-3 AW 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Marginal Suboptimal Poor Low Marginal: Non-maintained High Poor: ow Suboptimal ligh Suboptima Riparian areas awns, mowed Riparian areas High Marginal: lense herbaceo and maintained Low Poor: with tree stratum (dbh > 3 inches) vegetation, riparian areas with tree stratum (dbh > 3 inches) areas, nurseries Impervious ense herbaceou no-till cropland; surfaces, mine present, with vegetation with lacking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% actively grazed spoil lands. either a shrub layer or a tree layer (dbh > 3 30% tree canop cover and a tree stratum, hay production, ponds Riparian with > 60% tree canopy cover and an non-maintained understory. Wetlands to 60% tree anopy cover an pasture, sparsely vegetated nonenuded surface **Buffers** row crops, active maintained open water. If areas containing both herbaceous and maintained area feed lots, trails, or inches) present, with <30% tree understory present tree recently seeded other comparable

canopy cover.

High

0.85

stratum (dbh >3

inches) present

with <30% tree

canopy cover with maintained understory

Low

0.75

and stabilized, or

other comparable

condition.

High

0.6

Ensure the sums

of % Riparian

Blocks equal 100

conditions.

Low

0.5

100%

100%

1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the
descriptors.

2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you

shrub layers or a

non-maintained

understory

High

1.2

Recent cutover

(dense

vegetation).

Low

1.1

Enter the % Riparian Area and Score for each riparian category in the blocks below.

1.5

Right Bank	% Riparian Area>	30%	60%	10%	
	Score >	1.5	0.85	0.5	

100% % Riparian Area> Left Bank

Score >

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

1.5

THE REACH CONDITION INDEX (RCI) >> RCI= (Riparian CI)/2

Rt Bank CI >

Lt Bank CI >

CI= (Sum % RA * Scores*0.01)/2

1.01

1.50

CI

1.26

0.63

N/A

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

INSERT PHOTOS:

Condition

Scores



Looking upstream at stream reach 109-D. The right riparian buffer consisted of 30% mature trees cover, 60% nonmaintained dense shrub and herbaceous vegetation, and 10% non-vegetated land. The left riparian buffer consisted of 100% mature forest cover cover.

Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact SAR # Project # **Project Name** Locality HUC Date Class length Factor 30544.01 Martinsville Connector (VDOT) 03010103 3/2/2019 110-A 161 N/A Henry R6 Name(s) of Evaluator(s) Stream Name and Information Stream Map Unnamed Tributary to Marrowbone Creek S-110: CE1-8/CD1-8 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Marginal Suboptimal Poor Low Marginal: Non-maintained High Poor: ow Suboptimal ligh Suboptima Riparian areas Riparian areas High Marginal: lense herbaceo and maintained Low Poor: with tree stratum (dbh > 3 inches) vegetation, riparian areas with tree stratum (dbh > 3 inches) areas, nurseries Impervious ense herbaceou no-till cropland; surfaces, mine present, with vegetation with lacking shrub and Tree stratum (dbh > 3 inches) presen esent, with 30% actively grazed spoil lands. either a shrub layer or a tree layer (dbh > 3 30% tree canop cover and a tree stratum, hay production, ponds Riparian with > 60% tree canopy cover and an non-maintained understory. Wetlands to 60% tree anopy cover an pasture, sparsely vegetated nonenuded surface **Buffers** row crops, active maintained open water. If containing both herbaceous and shrub layers or a maintained area feed lots, trails, or inches) present, with <30% tree understory present tree recently seeded other comparable Recent cutover stratum (dbh >3 and stabilized, or conditions. (dense canopy cover. inches) present, with <30% tree non-maintained other comparable vegetation). understory condition. canopy cover with maintained understory High Low High Low High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums descriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% CI % Riparian Area> 100% Rt Bank CI > 1.50 Left Bank 1.5 Lt Bank CI > 1.50 1.50 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.75 RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

N/A

INSERT PHOTOS:



Looking upstream at stream reach 110-A. The right and left riparian buffers consisted of 100% mature forest cover.

Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact SAR # Project # **Project Name** Locality HUC Date Class length Factor 30544.01 Martinsville Connector (VDOT) 03010103 3/2/2019 111-A N/A Henry R6 83 Name(s) of Evaluator(s) Stream Name and Information Stream Map Unnamed Tributary to Marrowbone Creek S-111: CB1-9/CC1-11 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Marginal Suboptimal Poor Low Marginal: Non-maintained High Poor: ow Suboptimal ligh Suboptima Riparian areas awns, mowed Riparian areas High Marginal: lense herbaceo and maintained Low Poor: with tree stratum (dbh > 3 inches) vegetation, riparian areas with tree stratum (dbh > 3 inches) areas, nurseries Impervious ense herbaceou no-till cropland; surfaces, mine present, with vegetation with lacking shrub and Tree stratum (dbh > 3 inches) presen esent, with 30% actively grazed spoil lands. either a shrub layer or a tree layer (dbh > 3 30% tree canop cover and a tree stratum, hay production, ponds Riparian with > 60% tree canopy cover and an non-maintained understory. Wetlands to 60% tree anopy cover an pasture, sparsely vegetated nonnuded surfac **Buffers** row crops, active maintained open water. If containing both herbaceous and shrub layers or a maintained area feed lots, trails, or inches) present, with <30% tree understory present tree recently seeded other comparable Recent cutover stratum (dbh >3 and stabilized, or conditions. (dense canopy cover. inches) present, with <30% tree non-maintained other comparable vegetation). understory condition. canopy cover with maintained understory High Low High High Low Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums descriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian . Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% CI % Riparian Area> Rt Bank CI > 1.50 Left Bank Score > 1.5 Lt Bank CI > 1.50 1.50 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.75 RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

N/A

INSERT PHOTOS:



 $Looking\ upstream\ at\ stream\ reach\ 111-A.\ The\ right\ and\ left\ riparian\ buffers\ consisted\ of\ 100\%\ mature\ forest\ cover.$

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 3/2/2019 112-A 35 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-112: CG1-5/CF1-3 AW **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	olicant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/2/2019	112-A	35	N/A
4. CHANNE livestock	L ALTERATION: Stream cross	sings, riprap, concr			traightening of ch	annel, channeliza	ation, embankmer		rictions,
	Negligible	Mii		al Category Mod	erate	Sev	vere	NOTES>>	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel	of the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been	is disrupted by any	Greater than 80% of by any of the chang in the parameter of	of reach is disrupted nel alterations listed guidelines AND/OR	1	
	unaltered pattern or has naturalized.	alterations listed in the parameter guidelines.	alterations listed in the parameter guidelines.	channelized, normal stable stream meander pattern has not recovered.	channelized, normal stable stream meander pattern has not recovered.		ored with gabion, r cement.		

THE REACH CONDITION INDEX (RCI) >>

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 112-A. The channel is slightly incised with some erosion along the banks. The right and left riparian buffers consisted of 100% mature forest cover, with wetlands along the left bank. The in-stream habitat was suboptimal with stable elements in 30-50% of the reach. No channel alterations were observed.

DESCRIBE	PROPOSED	IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 3/2/2019 113-A 81 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-113: CG5-14/CH8-15 AW **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 1.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 60% 40% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.14 1.32 1.5 0.6 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

Stream Impact Assessment Form Page 2										
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor	
30544.01	Martinsville Connecto	r (VDOT)	Henry	R3	03010103	3/2/2019	113-A	81	N/A	
4. CHANNEL livestock	ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of ch	annel, channeliza		nts, spoil piles, consti	ictions,	
	Negligible	Mir			erate	Sev	/ere	NOTEO		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is	of the channel	is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been		nei aiterations listed			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

1.50

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

0.5

INSERT PHOTOS:

SCORE



Looking upstream at stream reach 113-A. The reach had severely incised and eroded banks. The right riparian buffer consisted of 100% mature forest cover. The left buffer contained 60% mature forest cover and 40% maintained vegetation with kudzu cover. The in-stream habitat was poor, containing leaves and few pools. No channel alterations were observed.

DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 113-B 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 3/2/2019 109 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-113: CF3-15/CH8-15 AW **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 1.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 30% 70% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank 0.6 Lt Bank CI > 0.87 1.19 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

0.90

High

Score

1.5

Stream Impact Assessment Form Page 2										
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor	
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/2/2019	113-B	109	N/A	
4. CHANNEI livestock	L ALTERATION: Stream cross	ings, riprap, conci		concrete blocks, s	traightening of ch	annel, channeliza		nts, spoil piles, constr	ictions,	
	Negligible	Mi	nor		erate	Sev	/ere	NO I LOSS		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter	20-40% of the stream reach is	of the channel	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable	Greater than 80% of by any of the changing the parameter greater some solutions.	of reach is disrupted nel alterations listed juidelines AND/OR ored with gabion, r cement.			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

0.92

1.50

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

0.5

COMPENSATION REQUIREMENT (CR) >> N/A CR = RCI X LF X IF

INSERT PHOTOS:

SCORE



Looking upstream at stream reach 113-B. The reach had severely incised and eroded banks. The right riparian buffer consisted of 100% mature forested cover. The left buffer contained 30% mature forest cover and 70% maintained vegetation with kudzu cover. The in-stream habitat was poor, containing leaves and few pools. No channel alterations were observed.

DESCRIBE	PROPOSED	IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 113-C 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 3/2/2019 537 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-113: CF15-31/CH15-30C AW **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR naiority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 1.60 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 40% 60% 100% Right Bank Score > 1.5 0.6 CI= (Sum % RA * Scores*0.01)/2 98% 2% 100% Rt Bank CI > CI % Riparian Area> 0.96 Left Bank 1.5 Lt Bank CI > 0.62 0.79 0.6 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/2/2019	113-C	537	N/A
4. CHANNE	L ALTERATION: Stream cross	ings, riprap, conci		concrete blocks, s	straightening of cha	annel, channeliza	ation, embankmer	NOTES>>	rictions,
	Negligible	Mir	nor		erate	Se	vere	NOTES	
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% by any of the chan in the parameter g			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2) COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 113-C. The reach had incised and eroded banks. The right riparian buffer consisted of 40% mature forested cover and 60% maintained vegetation. The left buffer contained 98% maintained vegetation with kudzu cover and 2% PEM wetland cover. The in-stream habitat was poor, containing leaves and few pools. No channel alterations were observed.

DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 3/2/2019 114-A 156 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-114: CL1-12/CK1-11 AW **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 50% 50% 100% Right Bank Score > 1.5 0.6 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.05 Left Bank Lt Bank CI > 1.50 1.28 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

Project # Project Name (Applicant) Locality Cowardin Class. HUC Date SAR # / Data Point length Fact 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 3/2/2019 114-A 156 N/. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, istock Conditional Category Negligible Minor Moderate Severe NOTES>>
CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, stock Conditional Category
Conditional Category Negligible Minor Moderate Severe 40 - 60% of reach 160 - 80% of reach 161 -
Negligible Minor Moderate Severe 40 - 60% of reach 60 - 80% of reach is disrupted by any of the channel of the channel
is disrupted by any is disrupted by any
Channel Ilteration Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Ilteration Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. ILess than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered. Stream has been channelized, normal stable stream meander pattern has not recovered. Stream meander pattern has not recovered.

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 114-A. The reach has areas of erosion with natural rock present. The right riparian buffer consisted of 50% mature forest cover and 50% herbaceous vegetation. The left buffer consisted of 100% mature forest cover. The in-stream habitat was marginal with stable elements in 10-30% of the reach, including varied water velocity and depths, shade and undercut banks. Channel alterations include an ATV stream crossing.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 114-B 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 3/2/2019 416 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-114: CK11-25/CL11-22/C AW **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR naiority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 5% 95% 100% Right Bank Score > 0.6 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.46 Left Bank Lt Bank CI > 1.50 1.48 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

Stream Impact Assessment Form Page 2											
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor		
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/2/2019	114-B	416	N/A		
4. CHANNE	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of ch	annel, channeliza	ation, embankmer	nts, spoil piles, const	rictions,		
	Negligible	Mir	nor	Mod	erate	Sev	vere	11012077			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	is disrupted by any of the channel alterations listed in the parameter guidelines. If	of the channel	in the parameter g 80% of banks sh	of reach is disrupted nel alterations listed puidelines AND/OR ored with gabion, r cement.	1			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

COMPENSATION REQUIREMENT (CR) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 114-B. The reach has stable banks with few areas of erosion present. The right riparian buffer consisted of 95% mature forest cover and 5% maintained herbaceous vegetation. The left buffer consisted of 100% mature forest cover. The in-stream habitat included shade and riffles. No channel alterations were observed.

DESCRIBE PROPOSED IMPACT:	DE	SCR	BE I	PRO	POSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 3/2/2019 115-A 533 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-115: CO1-24/CP1-22/CR AW **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.50

High

Score

1.5

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	Project Name (Applicant) Locality Cowardin Class. HUC Date	Date	SAR # / Data Point	Impact / SAR length	Impact Factor			
30544.01	Martinsville Connecto	Henry	R3	03010103	3/2/2019	115-A	533	N/A	
4. CHANNEI livestock	L ALTERATION: Stream cross	ings, riprap, conc		concrete blocks, s	straightening of ch	annel, channeliza	ation, embankmer	nts, spoil piles, constr	ictions,
	L ALTERATION: Stream cross Negligible			al Category	erate		ation, embankmer		ictions,

tream has beer

channelized, normal stable

stream meande

pattern has not

stream has beer

channelized, normal stable

stream meander

pattern has not

0.7

recovere

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

s disrupted by any of the channel

Iterations listed i

the parameter guidelines.

1.3

Iterations listed

the parameter guidelines.

1.1

Channelization, dredging, alteration, or hardening absent. Stream has an

unaltered pattern or has naturalized.

1.5

THE REACH CONDITION INDEX (RCI) >>

1.38

CI

1.50

RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2) COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

by any of the channel alterations liste in the parameter guidelines AND/OR

80% of banks shored with gabion, riprap, or cement.

0.5

INSERT PHOTOS:

SCORE



Looking upstream at stream reach 115-A. The reach has slightly incised banks, with no channel alterations observed. The right and left riparian buffers consisted 100% mature forest cover. The in-stream habit was optimal and contained varied substrate sizes and shade. No channel alteration was present within this reach.

DESCRIBE PROPOSED IMPAC	T:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 3/2/2019 116-A 105 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-116: CT1-9/CS3-9 AW **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. 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Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	olicant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/2/2019	116-A	105	N/A
4. CHANNE livestock	L ALTERATION: Stream cross	sings, riprap, concr		concrete blocks, s	traightening of cha	annel, channeliza	ition, embankmer	nts, spoil piles, const	rictions,
	Negligible	Mir			erate	Sou		NO I E3>>	
				IVIOU	ciale	36	/ere		
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel	Greater than 80% of by any of the chan in the parameter g			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking downstream at stream reach 116-A. The reach had stable banks with some active erosion. The right and left riparian buffers consisted of 100% mature forest cover. The in-stream habitat was poor with stable elements in less than 10% of the reach. There are no known channel alterations.

DESCRIBE	PROPOSED	IMPACT:

Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact SAR # Project # **Project Name** Locality HUC Date Class length Factor 30544.01 Martinsville Connector (VDOT) 03010103 3/2/2019 116-B 163 Henry R6 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map ΑO Unnamed Tributary to Marrowbone Creek S-116: CT9-16/CS9-16 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Marginal Suboptimal Poor Low Marginal: Non-maintained High Poor: ow Suboptimal ligh Suboptima Riparian areas awns, mowed Riparian areas High Marginal: lense herbaceou and maintained Low Poor: with tree stratum (dbh > 3 inches) vegetation, riparian areas with tree stratum (dbh > 3 inches) areas, nurseries Impervious ense herbaceou no-till cropland; surfaces, mine present, with vegetation with lacking shrub and Tree stratum (dbh > 3 inches) present resent, with 30% actively grazed spoil lands. either a shrub layer or a tree layer (dbh > 3 30% tree canop cover and a tree stratum, hay production, ponds Riparian with > 60% tree canopy cover and an non-maintained understory. Wetlands to 60% tree anopy cover an pasture, sparsely vegetated nonenuded surface **Buffers** row crops, active maintained open water. If containing both herbaceous and maintained area feed lots, trails, or inches) present, with <30% tree understory present, tree recently seeded other comparable Recent cutover stratum (dbh >3 shrub layers or a and stabilized, or conditions. (dense canopy cover. inches) present, with <30% tree non-maintained other comparable vegetation). understory condition. canopy cover wit maintained understory Low Low High High High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums descriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% CI % Riparian Area> Rt Bank CI > 1.50 Left Bank Score > 1.5 Lt Bank CI > 1.50 1.50 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.75 RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

N/A

INSERT PHOTOS:



Looking downstream at stream reach 116-B. The right and left riparian buffers consisted of 100% mature forest cover.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 3/2/2019 117-A 350 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-117: CU1-9/CV1-8 AM **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 1.60 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/2/2019	117-A	350	N/A
I. CHANNEI vestock	L ALTERATION: Stream cross	ings, riprap, conci	rete, gabions, or o	concrete blocks, s	traightening of cha	annel, channeliza	tion, embankmen	nts, spoil piles, const	rictions,
	1		Conditions	l Cotogory				NOTES	
·	Negligible	Mir	Conditiona nor	al Category	erate	Sev	/ere	NOTES>>	
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is	Mode 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chang in the parameter of	of reach is disrupted nel alterations listed juidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2) N/A

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 117-A. The reach had overwidened, unstable banks. The right and left riparian buffers consisted of 100% mature forest cover. The in-stream habitat was suboptimal and contained woody debris, undercut banks and various substrate sizes. There are no known channel alterations.

DESCRIBE	PROPOSED	IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 117-B 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 3/2/2019 544 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-117: CU9-57/CY1-32 AM **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR naiority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 1.60 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

30544.01 Martinsville Connector (VDOT) Henry R3 03010103 3/2/2019 117-B 544 N/A CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, estock Conditional Category Negligible Minor Moderate Severe Negligible Minor House Burstein is disrupted by any of the channel alterations is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, open elective parameter the parameter brit he parameter brit parameter guidelines. If stream has been channelized, open elective parameter guidelines. If stream has been channelized, open elective parameter guidelines. If stream has been channelized, open elective parameter guidelines. If stream has been channelized, open elective parameter guidelines. If stream has been channelized, open elective parameter guidelines. If stream has been channelized, open elective parameter guidelines. If stream has been channelized, open elective parameter guidelines. If stream has been channelized, open elective parameter guidelines. If stream has been channelized, open elective parameter guidelines. If stream has been channelized, open elective parameter guidelines. If stream has been channelized, open elective parameter guidelines. If stream has been channelized, open elective parameter guidelines. If stream has been channelized, open elective parameter guidelines. If stream has been channelized on the parameter guidelines. If stream has been channelized, open elective parameter guidelines. If stream has been channelized on the parameter guidelines. If stream has been channelized on the parameter guidelines. If stream has been channelized on the parameter guidelines. If stream has been channelized on the parameter guidelines. If stream has been channelized on the parameter guidelines. If stream has been channelized on the parameter guidelines. If stream has been channelized on the parameter guidelines. If stream has been chann		St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, estock Conditional Category	Project #	Project Name (App	licant)	Locality		HUC	Date		•	-
Channel Alteration Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Channelization the branameter in the parameter in the paramet	30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/2/2019	117-B	544	N/A
Negligible Channel Alteration Channel pattern or has naturalized. Channel pattern or has naturalized.	4. CHANNE ivestock	L ALTERATION: Stream cross	ings, riprap, concr			traightening of ch	annel, channeliza	ation, embankmer		rictions,
Channel Alteration Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, negrenal etable. 40 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, negrenal etable. 60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, negrenal etable. 60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, negrenal etable. 60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, negrenal etable. 60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, negrenal etable. 60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, negrenal etable. 60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, negrenal etable.		Negligible	Mir			erate	Se	vere	NOTES>>	
guidelines. guidelines. stream meander stream meander pattern has not recovered. recovered.	Channel	Channelization, dredging, alteration,	Less than 20% of the stream reach is disrupted by any	20-40% of the stream reach is disrupted by any	is disrupted by any of the channel alterations listed in the parameter guidelines. If	is disrupted by any of the channel alterations listed in the parameter guidelines. If	Greater than 80% by any of the chan in the parameter of	of reach is disrupted nel alterations listed guidelines AND/OR		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 117-B. The reach had incised banks that have overwidened. The right and left riparian buffers consisted of 100% mature forest cover with wetlands within the left riparian buffer. The in-stream habitat was suboptimal with stable elements in 30-50% of the reach. There are no known channel alterations.

DESCRIBE PROPOSED IMPACT:	DE	SCR	BE I	PRO	POSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 117-C 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 3/2/2019 435 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-117: CU57-106-/CY32-62 AM **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR naiority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/2/2019	117-C	435	N/A
4. CHANNEI livestock	L ALTERATION: Stream cross	ings, riprap, conci		concrete blocks, s	traightening of ch	annel, channeliza	ation, embankmer	nts, spoil piles, const	rictions,
	Negligible							INU I E3>>	
	itogiigibio	IVII	nor	Mod	erate	Sev	vere		
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chan in the parameter g			

THE REACH CONDITION INDEX (RCI) >>

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2) N/A

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 117-C. The reach had little incision and erosion present. The right and left riparian buffers consisted of 100% mature forest cover with wetlands. The in-stream habitat was suboptimal and contained various substrate sizes. There are no known channel alterations.

DESCRIBE PROPOSED IMPACT:	DE	SCR	BE I	PRO	POSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 3/4/2019 117-D 161 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-117: DD32-38/DA12-17/C AW **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR naiority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.50

High

Score

1.5

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	нис	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/4/2019	117-D	161	N/A
4. CHANNE livestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	straightening of ch	annel, channeliza	ation, embankmer	nts, spoil piles, constr	rictions,
	Negligible	Mir			erate	Ser	vere	NO I LO	
					60 - 80% of reach			1	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	of the channel	is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	by any of the chan in the parameter of 80% of banks sh	of reach is disrupted nel alterations listed juidelines AND/OR ored with gabion, r cement.		

THE REACH CONDITION INDEX (RCI) >>

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 117-D. The reach had stable banks with few areas of erosion present. The right and left riparian buffers consisted of 100% mature forest cover with wetlands. The in-stream habitat was optimal with stable elements in greather than 50% of the reach. No channel alterations were observed.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 3/4/2019 117-E 419 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-117: DB1-25/DD1-31/DC AW **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR naiority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.50

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/4/2019	117-E	419	N/A
4. CHANNEI ivestock	L ALTERATION: Stream cross	ings, riprap, conci			traightening of cha	annel, channeliza	tion, embankmer		rictions,
			('AnditiAns						
	Magligible	Mi		al Category	orato	Sou	/OTO	NOTES>>	
Channel Alteration	Negligible Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mod 40 - 60% of reach is disrupted by any of the channel	is disrupted by any of the channel	Greater than 80% of by any of the changing the parameter grown of banks sh	of reach is disrupted nel alterations listed juidelines AND/OR ored with gabion, r cement.		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2) COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 117-E. The reach had incised banks with areas of active erosion. The right and left riparian buffers consisted of 100% mature forest cover with wetlands. The in-stream habitat was optimal with stable elements in greather than 50% of the reach. There are no known channel alterations.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 4/27/2019 117-F 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 82 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-117: ZZA1-6 JF **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR naiority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

Project # Project Name (Applicant) Locality Cowardin Class. HUC Date SAR # / Data Point length Factor 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 4/27/2019 117-F 82 N/A 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock Channel Alteration Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Alteration Less than 20% of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered. Severe Severe		St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock Conditional Category	Project #	Project Name (App	licant)	Locality		HUC	Date		-	-
Channel Alteration Negligible Minor Moderate Severe	30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	4/27/2019	117-F	82	N/A
Channel Alteration Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Channelization and the parameter guidelines. Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander guidelines. Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not pattern has		L ALTERATION: Stream cross	ings, riprap, concr			traightening of cha	annel, channeliza	ition, embankmer	nts, spoil piles, constr	rictions,
Channel Alteration Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Less than 20% of the channel alterations listed in the parameter guidelines. Less than 20% of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not part or cerement. 40 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not part or cerement. Greater than 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not part or cerement.				Condition	al Category				NOTES>>	
Channel Alteration Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not pattern		Negligible	NA:-							
			IVIII	nor			Ser	vere		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking downstream at Stream Reach 117-F. The stream is slightly incised with few areas of active erosion and 60-80% vegetative surface protection. The left and right bank riparian buffers consist of mature forest with greater than 60% tree canopy cover. Instream habitat was present in 30-50% of the stream. No channel alteration was present in the reach.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 3/2/2019 118-A 564 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-118: CW1-38/CX1-35 AW **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.50

High

Score

1.5

	St	ream Ir	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	3/2/2019	118-A	564	N/A
4. CHANNEI livestock	L ALTERATION: Stream crossi	ings, riprap, conc	rete, gabions, or o	concrete blocks, s	traightening of cha	annel, channeliza	ition, embankmen	ts, spoil piles, const	rictions,
			Conditiona	al Category				NOTES	
	Negligible	Mi	Conditiona nor	al Category	erate	Sev	/ere	NOTES>>	

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

CI

1.50

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2) COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

INSERT PHOTOS:

SCORE



Looking upstream at stream reach 118-A. The reach has incised banks with moderate erosion present. The right and left riparian buffers consisted of 100% mature forest cover. The in-stream habitat was optimal with stable elements in greather than 50% of the reach. There are no known channel alterations.

DESCRIBE	PROPOSED	IMPACT:

Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact SAR # Project # **Project Name** Locality HUC Date Class length Factor 30544.01 **Martinsville Connector (VDOT)** 03010103 3/2/2019 119-A 55 Henry R6 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map ΑO Unnamed Tributary to Marrowbone Creek S-119: CZ7-10/DA8-11 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Marginal Suboptimal Poor Low Marginal: Non-maintained High Poor: ow Suboptimal ligh Suboptima Riparian areas awns, mowed Riparian areas High Marginal: lense herbaceou and maintained Low Poor: with tree stratum (dbh > 3 inches) vegetation, riparian areas with tree stratum (dbh > 3 inches) areas, nurseries Impervious ense herbaceou no-till cropland; surfaces, mine present, with vegetation with lacking shrub and Tree stratum (dbh > 3 inches) present resent, with 30% actively grazed spoil lands. either a shrub layer or a tree layer (dbh > 3 30% tree canop cover and a tree stratum, hay production, ponds Riparian with > 60% tree canopy cover and an non-maintained understory. Wetlands to 60% tree anopy cover an pasture, sparsely vegetated nonenuded surface **Buffers** row crops, active maintained open water. If containing both herbaceous and shrub layers or a maintained area feed lots, trails, or inches) present, with <30% tree understory present, tree recently seeded other comparable Recent cutover stratum (dbh >3 and stabilized, or conditions. (dense canopy cover. inches) present, with <30% tree non-maintained other comparable vegetation). understory condition. canopy cover with maintained understory Low Low High High High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums descriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% CI % Riparian Area> 100% Rt Bank CI > 1.50 Left Bank Score > 1.5 Lt Bank CI > 1.50 1.50 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.75 RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

N/A

INSERT PHOTOS:



Looking upstream at stream reach 119-A. The right and left riparian buffers consisted of 100% mature forest cover.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 3/2/2019 119-B 93 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-119: DA1-8/CZ1-7 AW **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

Stream Impact Assessment Form Page 2										
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor	
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	3/2/2019	119-B	93	N/A	
4. CHANNE livestock	L ALTERATION: Stream cross	ings, riprap, concr			traightening of ch	annel, channeliza	ation, embankmer		rictions,	
	Negligible	Mir		al Category	erate	Say	vere	NOTES>>		
Channel	· · · · · · · · · · · · · · · · · · ·	Less than 20% of		40 - 60% of reach	60 - 80% of reach is disrupted by any			1		
Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.		of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	in the parameter g	nel alterations listed guidelines AND/OR lored with gabion,			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 119-B. The reach had few areas of erosion. The right and left riparian buffers consisted of 100% mature forest cover. The reach lacked habitat elements. No channel alteration in this reach.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 2/27/2019 121-A 45 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-121: C1-C/D1-3/G1-3/H1 AW **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 95% 5% 100% Right Bank Score > 1.5 0.6 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.46 Left Bank Lt Bank CI > 1.50 1.5 1.48 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

0.90

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	2/27/2019	121-A	45	N/A
4. CHANNEL livestock	L ALTERATION: Stream cross	ings, riprap, concr			traightening of cha	annel, channeliza	tion, embankmer		ictions,
			Conditiona	ol Cotogory					
								NOTES>>	
	Negligible	Mir		Mode	erate	Sev	/ere	NOTES>>	
Channel Alteration	Negligible Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mode 40 - 60% of reach is disrupted by any of the channel	60 - 80% of reach is disrupted by any of the channel alterations listed in		of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

INSERT PHOTOS:



Looking upstream at stream reach 121-A. The reach had stable bed and banks with vegetative protection and minor erosion. The right riparian buffer consisted of 95% mature forest cover and 5% herbaceous field, and the and left riparian buffer consisted of 100% mature forest cover. The in-stream habitat was marginal, and no channel alterations were

DESCRIBE PROPOSED IMPACT:	DE	SCR	BE	PRO	POSED	IMPACT
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 2/27/2019 122-A 152 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map S-122: E1-22 JB, WN, JF **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR naiority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.20 1.35 1.2 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	2/27/2019	122-A	152	N/A
4. CHANNE livestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of cha	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,
	Negligible	Mir			erate	Sev	/ere	NOTES>>	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	the parameter guidelines. If	is disrupted by any of the channel	Greater than 80% of by any of the chang in the parameter g 80% of banks sh	of reach is disrupted		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\9999.01\Images\Stream Assessment\IMG_2733.jpg)



and had active deposition. The left bank consisted of 60% suboptimal canopy cover and the right bank consisted of 100% optimal canopy cover. The instream habitat was poor throughout the reach, lacking riffles, pools, leaf packs and substrate of various particle sizes. The reach had channel alterations due to active livestock.

DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 03010103 2/27/2019 123-A 292 N/A Henry Name(s) of Evaluator(s) Stream Name and Information Stream Map JB/ WN/ JF S-123: C1-17, G 1-11 **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully developed wide bankfull benches Depositional features contribute to stability. The bankfull and low flow egetative protection present on less be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient than 80% of stream bed is covered by AND/OR V-shaped channels have diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 2.40 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.2 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 100% 100% Rt Bank CI > CI 1.20 Left Bank 1.5 Lt Bank CI > 1.50 1.35 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat elements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. Stream Gradient CI

Scores

1.5

0.9

0.5

High

1.50

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	2/27/2019	123-A	292	N/A
4. CHANNE	L ALTERATION: Stream cross	ings, riprap, conci		concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,
	Negligible	Mi	nor		erate	Sev	/ere	NOTES>>	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chang in the parameter of	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		

THE REACH CONDITION INDEX (RCI) >> 1.31

RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2) COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X L_I X IF

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Photos\01-Ex Conditions\Alignment 4B\JB)

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.



fers consisted of 100% optimal canopy cover. The instream habitat throughout the reach consisted of riffles, pools, leaf packs and substrate

of various particle size. The reach had channel alterations due to active livestock.

DESCRIBE	PROPOSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 2/27/2018 123-B 541 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JB, WN, JF **Unnamed Tributary to Marrowbone Creek** S-123: G11-45, C16-40 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR naiority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 95% 5% 100% Right Bank Score > 0.6 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > 0.65 CI % Riparian Area> Left Bank Lt Bank CI > 1.50 1.07 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	2/27/2018	123-B	541	N/A
4. CHANNE livestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of cha	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,
	Negligible	Mir			erate	Sev	/ere	INO IES>>	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel	Greater than 80% of by any of the chang in the parameter g	of reach is disrupted	I	

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



consisted of 100% optimal canopy cover. The right reparian buffer consisted of 95% open active livestock pasture and 5% optimal canopy cover. The instream habitat consisted of riffles, pools and substrate of various particle sizes, but had excess sediment and silt due to active erosion. The reach had channel alterations due to active livestock.

DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 2/27/2019 124-A 105 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map S-124: G19-24, G30-32, I6-JB, WN, JF **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR naiority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 1.60 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	2/27/2019	124-A	105	N/A
4. CHANNE livestock	L ALTERATION: Stream cross	ings, riprap, concr			traightening of cha	annel, channeliza	tion, embankmer		rictions,
	Negligible	niM		al Category	oroto	C		NOTES>>	
				IVIOU	erate	Sev	/ere		
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chang in the parameter of	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\9999.01\Images\Stream Assessment\IMG_2733.jpg)



Lookin upstreat of 100% optimal canopy cover. In-stream habitat elements are present in 30-50% of the reach. The reach is altered by

DESCRIBE PROPOSED IMPACT:

Ephemeral Stream Assessment Form (Form 1a)

Unified Stream Methodology for use in Virginia

		1 01 43	c iii epiieiiieiai s	ti cui iio				
Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor
30544.01	Martinsville Connector (VDOT)	Henry	R6	03010103	03010103	125-A	14	N/A
Name	e(s) of Evaluator(s) Stream Nam	e and Informa	ation				Stream Man	

Unnamed Tributary to Marrowbone Creek 125: C41-44

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Canditional Catagony

		Con	ditional Cate	gory			
	Optimal	Subo	ptimal	Mar	ginal	Po	oor
Riparian Buffers	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an non-maintained understory. Wetlands areas.	to 60% tree	with tree stratum (dbh > 3 inches) present, with >30% tree canopy	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surface row crops, active feed lots, trails, o other comparable conditions.
		High	Low	High	Low	High	Low
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5

Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors. 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you

3. Enter the % Riparian Area and Score for each riparian category in the blocks below.

0.6

Right Bank	% Riparian Area>	95%	5%			100%
Kigiit Balik	Score >	0.6	1.2			

100% 100% % Riparian Area> Left Bank

THE REACH CONDITION INDEX (RCI) >> RCI= (Riparian CI)/2

Rt Bank CI >

Lt Bank CI >

CI= (Sum % RA * Scores*0.01)/2

0.63

0.60

CI

0.62

0.31

NOTES>>

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

Ensure the sums

of % Riparian

Blocks equal 100

INSERT PHOTOS:



REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

and 5% suboptimal canopy cover. The left riparian buffer is 100% open active cattle pasture.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 2/27/2019 126-A 145 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JB/ WN/ JF S-126: H32-39, J24-30 **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. 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Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

Project # 30544.01 4. CHANNEL livestock	Project Name (App Martinsville Connecto ALTERATION: Stream crossi	or (VDOT)		Cowardin Class. R4	HUC 03010103	Date 2/27/2019 annel, channeliza	SAR # / Data Point 126-A tion, embankmen	Impact / SAR length 145 hts, spoil piles, constr	Impact Factor N/A
4. CHANNEL		• •	rete, gabions, or o						
	ALTERATION: Stream crossi	ings, riprap, conci		concrete blocks, s	straightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, constr	rictions,
				al Category				NOTES>>	
	Negligible	Mii	nor		erate	Sev	/ere		
Aiteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	of the channel alterations listed in the parameter guidelines. If	80 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% of by any of the chair in the parameter g 80% of banks shriprap, or	nel alterations listed uidelines AND/OR ored with gabion,		
SCORE	1.5	1.3	1.1	0.9	0.7	0.	.5		

THE REACH CONDITION INDEX (RCI) >>

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2) N/A

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



buffer consisted of 100% optimal canopy cover. The instream habitat throughout the reach consisted of riffles, pools, and leaf packs. The channel had no alterations.

DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 126-B 30544.01 Martinsville Connector (VDOT) R4 03010103 2/27/2019 310 N/A Henry Name(s) of Evaluator(s) Stream Name and Information Stream Map JB/ WN/ JF S-126: H17-32, J2-15 **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully developed wide bankfull benches Depositional features contribute to stability. The bankfull and low flow egetative protection present on less be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient AND/OR V-shaped channels have than 80% of stream hed is covered by diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 2.00 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 100% 100% Rt Bank CI > CI 1.50 Left Bank 1.5 Lt Bank CI > 1.50 1 50 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat elements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. **Stream Gradient** CI

Scores

1.5

0.9

0.5

High

1.20

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	2/27/2019	126-B	310	N/A
4. CHANNE livestock	L ALTERATION: Stream cross	ings, riprap, conci		concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer	NOTES>>	rictions,
	Negligible	Mir	nor		erate	Sev	/ere	NOTES>>	
				40 - 60% of reach is disrupted by any	60 - 80% of reach			1	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is	of the channel alterations listed in the parameter guidelines. If	of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	in the parameter g	nei aiterations listed juidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.24

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A CR = RCI X L_I X IF

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



Looking packs and substrate of various particle sizes. The channel had no alterations.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 126-C 30544.01 Martinsville Connector (VDOT) R4 03010103 4/26/2019 89 N/A Henry Stream Name and Information Name(s) of Evaluator(s) Stream Map JF **Unnamed Tributary to Marrowbone Creek** S-126: Approximate 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully developed wide bankfull benches Depositional features contribute to stability. The bankfull and low flow egetative protection present on less be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sedimen portions of the reach. Transient than 80% of stream hed is covered by diment covers 10-40% of the stream bottom. deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 2.00 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceou and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 100% 100% Rt Bank CI > CI 1.50 Left Bank 1.5 Lt Bank CI > 1.50 1 50 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. Stream Gradient CI

Scores

1.5

0.9

0.5

High

0.90

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	03010103	4/26/2019	126-C	89	N/A
4. CHANNE livestock	L ALTERATION: Stream cross	sings, riprap, conci		concrete blocks, s	traightening of cha	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,
	Negligible	Mi	nor		erate	Sev	/ere	140123>>	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is	is disrupted by any of the channel alterations listed in the parameter guidelines. If	of the channel	Greater than 80% of by any of the chang in the parameter of	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,	I	

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.06 RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X L_I X IF

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



Looking he stream banks with moderate sediment deposits. The left and right bank riparian buffers consist of wetlands. Instream habitat is present in 10-30% of the reach. Livestock alters 40-60% of the channel for this stream reach.

DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 2/27/2019 127-A 75 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JB/ WN/ JF **Unnamed Tributary to Marrowbone Creek** S-127: J15-25 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully developed wide bankfull benches Depositional features contribute to stability. The bankfull and low flow egetative protection present on less be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient AND/OR V-shaped channels have than 80% of stream hed is covered by diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 1.60 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceou and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover ar either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 100% 100% Rt Bank CI > CI 1.50 Left Bank 1.5 Lt Bank CI > 1.50 1 50 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. Stream Gradient CI

Scores

1.5

0.9

0.5

High

0.50

Stream Impact Assessment Form Page 2									
Project #	Project Name (Applicant) Locality Cowardin Class. HUC Date SAR # / Impact / SAR Impact Pata Point Iength Factor								
30544.01	Martinsville Connecto	Henry	R4	03010103	2/27/2019	127-A	75	N/A	
4. CHANNE livestock	L ALTERATION: Stream cross	ings, riprap, conc			traightening of ch	annel, channeliza	tion, embankmer		rictions,
	Negligible	Conditional Category			Sev	/ere	NOTES>>		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter		140 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable	of the channel alterations listed in	in the parameter g	nel alterations listed uidelines AND/OR ored with gabion,	1	
		guidelines.	guidelines.	stream meander pattern has not recovered.	stream meander pattern has not recovered.				

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.02 RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L_I X IF

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



consisted of 100% optimal canopy cover. The instream habitat was poor throughout the reach, lacking riffles, pools, leaf packs and substrate of various particle sizes. The reach had no channel alterations.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 03010103 2/28/2019 128-A 539 N/A Henry Name(s) of Evaluator(s) Stream Name and Information Stream Map JB/ WN/ JF **Unnamed Tributary to Marrowbone Creek** S-128: L1-28, K9-37 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully developed wide bankfull benches Depositional features contribute to stability. The bankfull and low flow egetative protection present on less be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient than 80% of stream bed is covered by AND/OR V-shaped channels have diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 2.40 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 100% 100% Rt Bank CI > CI 1.50 Left Bank 1.5 Lt Bank CI > 1.50 1 50 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat elements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. **Stream Gradient** CI

Scores

1.5

0.9

0.5

High

1.50

	St	tream Ir	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	DOT) Henry	R3	03010103	2/28/2019	128-A	539	N/A	
4. CHANNE	L ALTERATION: Stream cross	sings, riprap, conc		concrete blocks, s	traightening of ch	annel, channeliza	ition, embankmer	NOTES>>	rictions,
	Negligible	nor Moderate Severe				/ere	NOTES>>		
Channel Alteration	Channelization, dredging, alteration,	Less than 20% of the stream reach is disrupted by any	20-40% of the stream reach is disrupted by any	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	is disrupted by any	Greater than 80% of by any of the chang	of reach is disrupted		
Alteration	or hardening absent. Stream has an unaltered pattern or has naturalized.	of the channel alterations listed in the parameter guidelines.	of the channel alterations listed in the parameter guidelines.	stroam has boon	stream has been channelized, normal stable stream meander pattern has not recovered.		uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.38 RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X L_I X IF

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH\



Looking upstream at Stream Reach 128-A. The reach had optimal channel condition. The right and left riparian buffer consisted of 100% optimal canopy cover. The instream habitat throughout the reach consisted of riffles, pools, leaf packs and substrate of various particle size. The reach had no channel alterations.

DESCRIBE PROPOSED IMPAC	T:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 02070010 2/28/2019 129-A 55 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JB/ WN/ JF **Unnamed Tributary to Marrowbone Creek** S-129: K1-9 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR naiority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 80% 20% 100% Right Bank Score > 1.5 1.1 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.42 Left Bank Lt Bank CI > 1.50 1.5 1.46 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

Stream Impact Assessment Form Page 2										
Project #	Project # Project Name (Applicant) Locality Cowardin Class. HUC Date SAR # / Data Point length Factor									
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	02070010	2/28/2019	129-A	55	N/A	
4. CHANNE livestock	L ALTERATION: Stream cross	ings, riprap, concr			traightening of cha	annel, channeliza	ition, embankmer	nts, spoil piles, const	rictions,	
	Negligible	Conditional Category or Moderate			Severe		NOTES>>			
					Ciuto	OC.	/CIC			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is	is disrupted by any of the channel alterations listed in the parameter guidelines. If	is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chann in the parameter g	of reach is disrupted			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



fer consisted of 80% optimal canopy cover and 20% of non-maintained herbaceous cover with subpotimal canopy cover. The left riparian buffer consisted of 100% optimal canopy cover. The instream habitat consisted of leaf packs and substrate of various particle size but lacked riffle pool complexes. The reach had no channel alterations.

DESCRIBE	PROPOSED	IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 02070010 2/28/2019 130-A 61 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JB/ WN/ JF **Unnamed Tributary to Marrowbone Creek** S-130: M4-8, N5-12 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. 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Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project # Project Name (Applicant) Locality noc Date							Impact Factor	
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	02070010	2/28/2019	130-A	61	N/A
4. CHANNEL ivestock	L ALTERATION: Stream cross	ings, riprap, conci			traightening of ch	annel, channeliza	ition, embankmer		ictions,
			Condition	al Category				NOTES>>	
	Negligible	Mi	nor	al Category Mod	erate	Se	/ere	NOTES>>	

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

1.50

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

INSERT PHOTOS:

SCORE

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



Looking downstream at Stream Reach 130-A. The reach was moderately incised with areas of active erosion. The right and left riparian buffer consisted of 100% optimal canopy cover. The instream habitat consisted of leaf packs and substrate of various particle size but lacked riffle and pool complexes and had excess sediment and silt due to active erosion. The reach had no channel alterations.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 130-B 30544.01 Martinsville Connector (VDOT) Henry R4 02070010 2/28/2019 421 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JB/ WN/ JF S-130: N12-24, M8-29 **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. 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Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



Looking downstream at Stream Reach 130-B. The reach was moderately incised with areas of active erosion. The right and left riparian buffer consisted of 100% optimal canopy cover. The instream habitat consisted of leaf packs and substrate of various particle size but had excess sediment and silt due to active erosion. The reach had no channel alterations.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 03010103 2/28/2019 131-A 35 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JB/ WN/ JF S-131: O1, P6-8 **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully developed wide bankfull benches Depositional features contribute to stability. The bankfull and low flow egetative protection present on less be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient AND/OR V-shaped channels have than 80% of stream hed is covered by diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 2.00 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceou and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 100% 100% Rt Bank CI > CI 1.50 Left Bank 1.5 Lt Bank CI > 1.50 1 50 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat lements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. Stream Gradient CI

Scores

1.5

0.9

0.5

High

1.50

Stream Impact Assessment Form Page 2										
Project #	rolect # Project Name (Applicant) Locality Huc Date ' '								Impact Factor	
30544.01	Martinsville Connector (VDOT)		Henry	R3	03010103	2/28/2019	131-A	35	N/A	
4. CHANNEI livestock	L ALTERATION: Stream cross	ings, riprap, conci		concrete blocks, s	traightening of cha	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,	
	Negligible	<u> </u>			Sev	/ere	NOTES			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	is disrupted by any of the channel alterations listed in the parameter guidelines. If	of the channel alterations listed in	by any of the chanr	nel alterations listed uidelines AND/OR ored with gabion,			
Scores	1.5	1.3	1.1	0.9	0.7	0	.5			
	REACH (CONDITION	NDEX and	STREAM CO	NDITION UN	IITS FOR TH	IIS REACH			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.30 RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L_I X IF

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH\



htout. The right

and left riparian buffers consisted of 100% optimal canopy cover. The instream habitat throughout the reach consisted of riffles, pools, leaf packs and substrate of various particle size. The reach had no channel alterations.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 03010103 2/28/2019 132-A 587 N/A Henry Name(s) of Evaluator(s) Stream Name and Information Stream Map JB/ WN/ JF **Unnamed Tributary to Marrowbone Creek** S-132: T8-43, S6-35 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe of /erv little incision or active erosion: 8 Overwidened/incised, Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable sion or unprotected banks. Majorit of banks are stable (60-80%). laterally unstable. Likely to widen further. Majority of both banks are vertical/lateral instability. Severe incision, flow contained within the Poor, Banks more stable than Severe or Poor due to lower bank slopes. Channel Vegetative protection or natural rock Erosion may be present on 40-60% or near vertical. Erosion present on 60 banks. Streambed below average Condition banks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% both banks. Vegetative protection on 40-60% of banks. Streambanks may ankfull benches are present. Acces prominent (60-80%) AND/OR majority of banks vertical/undercut. to their original floodplain or fully developed wide bankfull benches Depositional features contribute to stability. The bankfull and low flow egetative protection present on less be vertical or undercut. AND/OR than 20% of banks, is not preventing the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel channel hars and transverse hars few channels are well defined. Stream 40-60% Sediment may be temporary Transient sediment deposition covers less than 10% of bottom. transient, contribute instability. Deposition that contribute to stability likely has access to hankfull benches,or newly developed may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and portions of the reach. Transient AND/OR V-shaped channels have than 80% of stream hed is covered by diment covers 10-40% of the stream bottom. vegetative protection is present on > 40% of the banks and stable sedimer deposition, contributing to instability Multiple thread channels and/or depositional features which contribute deposition is absent subterranean flow. CI to stability. 3 2.4 2 1.6 1 2.00 **Scores** NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: w Suboptima ligh Suboptima ns, mowed High Marginal: Riparian areas ense herbaceous and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained Impervious surfaces, mine with tree stratum areas, nurseries no-till cropland; (dbh > 3 inches) resent, with 30% vegetation with acking shrub and Tree stratum (dbh > 3 inches) presen resent, with 30% tree stratum, hay production, ponds open water. If actively grazed spoil lands. to 60% tree anopy cover an either a shrub layer or a tree Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree pasture, sparsel vegetated nonnuded surface **Buffers** row crops, active a maintained layer (dbh > 3 areas. containing both maintained area eed lots, trails, o understory. Recent cutover (dense inches) present with <30% tree present, tree stratum (dbh >3 herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition anopy cover v maintained understory High Low High High Low Low 1.5 0.85 0.75 0.6 0.5 **Scores** 1.2 1.1 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 100% 100% Rt Bank CI > CI 1.50 Left Bank 1.5 Lt Bank CI > 1.50 1 50 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Instream Habitat/ Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of Habitat elements listed above are Available lacking or are unstable. Habitat elements are typically present in less Habitat elements are typically prese in greater than 50% of the reach. Cover populations. populations. than 10% of the reach. **Stream Gradient** CI

Scores

1.5

0.9

0.5

High

1.50

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	03010103	2/28/2019	132-A	587	N/A
4. CHANNE livestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of cha	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,
	Negligible	Mir	nor		erate	Sev	/ere	NOTES	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is	is disrupted by any of the channel alterations listed in the parameter guidelines. If	of the channel	by any of the chang in the parameter g 80% of banks sh	of reach is disrupted	I	

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >> 1.30 RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X L_I X IF

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH\



ghout. The right and left riparian buffer consisted of 100% optimal canopy cover. The instream habitat throughout the reach consisted of riffles, pools, leaf packs and substrate of various particle size. The reach had no channel alterations.

DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 132-B 30544.01 Martinsville Connector (VDOT) Henry R3 02070010 2/28/2019 160 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JB/ WN/ JF **Unnamed Tributary to Marrowbone Creek** S-132: T1-8, S1-6 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR naiority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	02070010	2/28/2019	132-B	160	N/A
4. CHANNE livestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of cha	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,
	Negligible	Mir			erate	Sev	/ere	NOTES>>	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	the parameter guidelines. If	is disrupted by any of the channel	Greater than 80% of by any of the chang in the parameter g 80% of banks sh			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



Looking under the right and left riparian buffer consisted of 100% optimal canopy cover. The instream habitat consisted of leaf packs and substrate of various particle size but lacked riffle pool complexes and had excess sediment and silt due to active erosion. The reach had no channel alterations.

DESCRIBE PROPOSED IMPACT:

Ephemeral Stream Assessment Form (Form 1a)

Unified Stream Methodology for use in Virginia

For use in ephemeral streams

				p					
Project #	Project Name	•	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R6	03010103	3/1/2019	133-A	203	N/A
Name	e(s) of Evaluator(s)	Stream Nam	e and Informa	ation				Stream Map	
	JB/ WN/ JF	Unnamed Tr	ibutary to Ma	rrowbone Cr	eek			S-133: U1-9,	V1-9

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

		Con	ditional Cate	gory			
	Optimal	Subo	ptimal	Mar	ginal	Po	oor
Riparian Buffers	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an non-maintained understory. Wetlands areas.	to 60% tree	with tree stratum (dbh > 3 inches) present, with >30% tree canopy	High Marginal: Non-maintained, dense herbaceous vegetation with	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surface row crops, active feed lots, trails, o other comparable conditions.
		High	Low	High	Low	High	Low
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5

 Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.

descriptors.

2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.

3. Enter the % Riparian Area and Score for each riparian category in the blocks below.

Right Bank	% Riparian Area>	100%		
Right Bank	Score >	1.5		
	% Riparian Area>	100%		

Score > 1.5

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

100% Rt Bank CI > 1.50 CI
Lt Bank CI > 1.50 1.50

RTHIS REACH

CI= (Sum % RA * Scores*0.01)/2

0.75

THE REACH CONDITION INDEX (RCI) >> RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >> N/A

NOTES>>

CR = RCI X LF X IF

Ensure the sums

of % Riparian

Blocks equal 100

100%

INSERT PHOTOS:

Left Bank



canopy cover.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 133-B 30544.01 Martinsville Connector (VDOT) Henry R4 02070010 3/01/2019 144 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JB/ WN/ JF S-133: U9-15, V9-13 **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	02070010	3/01/2019	133-B	144	N/A
4. CHANNEL livestock	L ALTERATION: Stream cross	ings, riprap, conci		concrete blocks, s	traightening of cha	annel, channeliza	tion, embankmer	nts, spoil piles, constr	ictions,
	Negligible	Mi	nor		erate	Sev	rere	NOTES	
				40 - 60% of reach is disrupted by any of the channel	is disrupted by any				
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	alterations listed in the parameter guidelines. If	of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	by any of the chann	uidelines AND/OR ored with gabion,	1	

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

COMPENSATION REQUIREMENT (CR) >> N/A CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



Looking upstream at Stream Reach 133-B. The reach was moderately incised with areas of active erosion. The right and left riparian buffer consisted of 100% optimal canopy cover. The instream habitat consisted of riffles, pools, leaf packs and substrate of various particle size but had excess sediment and silt due to active erosion. The reach had no channel

DESCRIBE	PROPOSED	IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 02070010 3/01/2019 134-A 1,487 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JB/ WN/ JF S-134: W1-79, X161A **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	02070010	3/01/2019	134-A	1,487	N/A
4. CHANNE livestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of cha	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,
			Conditions	ar Category				NO I ES>>	
	Negligible	Mir	nor	Mod	erate	Sev	rere		
Channel Alteration	Negligible Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chann in the parameter g 80% of banks sh riprap, or	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		

THE REACH CONDITION INDEX (RCI) >>

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number. RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



The right and left riparian buffer consisted of 100% optimal canopy cover. The instream habitat consisted of riffles, pools, leaf packs and substrate of various particle size but had excess sediment and silt due to active erosion. The reach had no channel

DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 134-B 30544.01 Martinsville Connector (VDOT) Henry R3 02070010 3/01/2019 500 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JB/ WN/ JF **Unnamed Tributary to Marrowbone Creek** S-134: X63-71, Z13-21 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

	St	ream Ir	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	02070010	3/01/2019	134-B	500	N/A
4. CHANNEL livestock	L ALTERATION: Stream cross	ings, riprap, conc			traightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,
	No offering			al Category				NOTES>>	
	Negligible	IVII	nor		erate	Sel	/ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	by any of the chanr	nel alterations listed uidelines AND/OR ored with gabion,		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		
	REACH (CONDITION	NDFX and S	STREAM CO	NDITION UN	IITS FOR TH	IS REACH		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2) N/A

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



consisted of 100% optimal canopy cover. The instream habitat consisted of riffles, pools, leaf packs and substrate of various particle size but had excess sediment and silt due to active erosion. The reach had no channel alterations.

DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 02070010 3/01/2019 135-A 16 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JB/ WN/ JF S-135: X2-5 **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

0.90

High

Score

1.5

Project # Project Name (Applicant) Locality Class. HUC Date SAR # / Data Point length Factor 30544.01 Martinsville Connector (VDOT) Henry R4 02070010 3/01/2019 135-A 16 N/A 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock Channel Alteration Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Alterameter guidelines. Channelized, normal stable stream meander pattern has not recovered. Channelized, normal stable stream meander pattern has not recovered. Covered. C		St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, ivestock Conditional Category	Project #	Project Name (App	licant)	Locality		HUC	Date		I	-
Channel Alteration Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Alteration Channelization alterations listed in the parameter guidelines. Channelization alterations listed in the parameter guidelines. Channelization alterations listed in the parameter guidelines. Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Channelization, dredging, alteration, is disrupted by any of the channel alterations listed in the parameter guidelines. If the parameter guidelines alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not pattern pattern has not pattern pattern has not pattern pattern has not pattern pattern pattern has not pattern patt	30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	02070010	3/01/2019	135-A	16	N/A
Channel Alteration Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Channelized maturalized. Channelized pattern or has naturalized. Channelized pattern has not be parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not be pat		L ALTERATION: Stream cross	ings, riprap, concr			traightening of ch	annel, channeliza	ition, embankmer		ictions,
Channel Alteration Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Channelized in the parameter guidelines. Less than 20% of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander guidelines. Less than 20% of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not less than 20% of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not less than 20% of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not less than 20% of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not less than 20% of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not less than 20% of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not less than 20% of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not less than 20% of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not less than 20% of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not less than 20% of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not less than 20% of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not less than 20% of the channe									NOTES>>	
Channel Alteration Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Channelization is test on the stream reach is in disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander guidelines. If stream has been channelized, normal stable stream meander pattern has not pat		Negligible	Min	nor			Sev	/ere		

THE REACH CONDITION INDEX (RCI) >>

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

CR = RCI X LF X IF

COMPENSATION REQUIREMENT (CR) >>

N/A

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



Looking upstream at Stream Reach 135-A. The reach was moderately incised with areas of active erosion. The right and left riparian buffer consisted of 100% optimal canopy cover. The instream habitat had leaf packs and substrate of various particle size but lacked riffle and pool complexes. The reach had no channel alterations.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 02070010 3/01/2019 136-A N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JB/ WN/ JF S-136: X39-42 **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	02070010	3/01/2019	136-A	7	N/A
4. CHANNEl livestock	L ALTERATION: Stream cross	ings, riprap, concr			traightening of cha	annel, channeliza	tion, embankmer		rictions,
	Negligible	niM		al Category Mod	erate	Sev	/ere	NOTES>>	
				40 - 60% of reach	60 - 80% of reach				
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	is disrupted by any of the channel alterations listed in	by any of the chang in the parameter g	nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



consisted of 100% optimal canopy cover. The instream habitat was marginal throughout the reach, lacking riffles, pools and leaf packs. The reach had no channel alterations.

DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 02070010 3/01/2019 137-A 68 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JB/ WN/ JF **Unnamed Tributary to Marrowbone Creek** S-137: W52-59 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

0.90

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	02070010	3/01/2019	137-A	68	N/A
4. CHANNE livestock	L ALTERATION: Stream cross	ings, riprap, conci			traightening of ch	annel, channeliza	tion, embankmer		rictions,
	Negligible	Mir	Conditiona nor	al Category	erate	Sev	/ere	NOTES>>	
				40 - 60% of reach	60 - 80% of reach				
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	is disrupted by any of the channel alterations listed in	in the parameter g 80% of banks sh	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion, r cement.	1	

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



Looking consisted of 100% optimal canopy cover. The instream habitat was marginal throughout the reach, lacking riffles, pools and leaf packs. The reach had no channel alterations.

DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 02070010 3/01/2019 138-A 53 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JB/ WN/ JF **Unnamed Tributary to Marrowbone Creek** S-138: W69-75 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 1.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, stock Conditional Category Negligible Minor Moderate Severe ULess than 20% of the stream reach is disrupted by any of the channel alterations listed in plantable in parameter is parameter the parameter in the param		St	tream Ir	npact A	ssessn	nent Fo	rm Pag	e 2		
CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, stock Conditional Category	Project #	Project Name (App	licant)	Locality		HUC	Date		•	Impact Factor
Channel Iteration Channelization, dredging, alteration, or hardening absent. Stream has a unaltered pattern or has naturalized. Channelized in the parameter guidelines and unaltered pattern or has naturalized. Channelized in the parameter guidelines and in the parameter guidelines a	30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	02070010	3/01/2019	138-A	53	N/A
Negligible Minor Moderate Severe 40 - 60% of reach 160 - 80% of rea	CHANNEL estock	. ALTERATION: Stream cross	sings, riprap, conc			traightening of cha	annel, channeliza	tion, embankmer		ictions,
Channel Iteration Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Less than 20% of the channel alterations listed in the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable onormal stable onormal stable in commal stable in the parameter guidelines. If stream has been channelized, normal stable in commal stable in commal stable in commal stable in the parameter guidelines. If stream has been channelized, normal stable in commal stable in the parameter guidelines. If stream has been channelized, normal stable in the parameter guidelines. If stream has been channelized, normal stable in the parameter guidelines. If stream has been channelized, normal stable in the parameter guidelines. If stream has been channelized, normal stable in the parameter guidelines. If stream has been channelized, normal stable in the parameter guidelines. If stream has been channelized, normal stable in the parameter guidelines. If stream has been channelized, normal stable in the parameter guidelines. If stream has been channelized, normal stable in the parameter guidelines. If stream has been channelized, normal stable in the parameter guidelines. If stream has been channelized.		Negligible	Mi			erate	Se	/ere	NOTES	
pattern has not recovered.	Channel Alteration	or hardening absent. Stream has an	the stream reach is disrupted by any of the channel alterations listed in the parameter	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter	is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not	is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not	in the parameter of 80% of banks sh	nei aiterations listed juidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



Looking downstream at Stream Reach 138-A. The reach was severely incised with active erosion thoughout. The right and left riparian buffer consisted of 100% optimal canopy cover. The instream habitat was poor throughout the reach, lacking riffles, pools and leaf packs. The reach had no channel alterations.

DESCRIBE PROPOSED IMPACT:	DE	SCR	BE I	PRO	POSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 02070010 3/01/2019 139-A 160 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JB/ WN/ JF **Unnamed Tributary to Marrowbone Creek** S-139: X71-91, Z1-13 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	02070010	3/01/2019	139-A	160	N/A
4. CHANNE livestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,
	Negligible	Mir			erate	Sev	/ere	NOTEOFF	
Channel	Channelization, dredging, alteration,	Less than 20% of the stream reach is disrupted by any	20-40% of the stream reach is	the parameter	is disrupted by any of the channel alterations listed in	Greater than 80% of			
Alteration	or hardening absent. Stream has an unaltered pattern or has naturalized.	of the channel alterations listed in the parameter guidelines.	of the channel	guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.		uidelines AND/OR ored with gabion,		

THE REACH CONDITION INDEX (RCI) >>

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



Looking buffer consisted of 100% optimal canopy cover. The instream habitat consisted of riffles, pools, leaf packs and substrate of various particle size but had excess sediment and silt due to active erosion. The reach had no channel alterations.

DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 02070010 3/01/2019 140-A 14 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JB/ WN/ JF **Unnamed Tributary to Marrowbone Creek** S-140: AC13-10 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	02070010	3/01/2019	140-A	14	N/A
4. CHANNEI	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer	NOTES>>	rictions,
	Negligible	Mir	nor		erate	Sev	/ere	11012022	
Channel Alteration	or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is	is disrupted by any of the channel alterations listed in the parameter guidelines. If	of the channel alterations listed in	in the parameter g 80% of banks sh	of reach is disrupted		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



Looking and left riparia buffer consisted of 100% optimal canopy cover. The instream habitat was poor throughout the reach, lacking riffles, pools, substrate of various particle sizes and leaf packs. The reach had no channel alterations.

DESCRIBE	PROPOSED	IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) R3 02070010 3/01/2019 141-A 439 N/A Henry Name(s) of Evaluator(s) Stream Name and Information Stream Map JB/ WN/ JF S-141: AC1-121, AD1-8 Marrowbone Creek?? 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	нис	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	02070010	3/01/2019	141-A	439	N/A
4. CHANNEI livestock	L ALTERATION: Stream cross	ings, riprap, concr			traightening of ch	annel, channeliza	tion, embankmer		rictions,
			Conditiona	al Category				NOTES>>	
						•		110120	
	Negligible	Mir	nor		erate	Sev	ere	11012022	
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander	Greater than 80% of by any of the chann	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		
	Channelization, dredging, alteration, or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable	Greater than 80% of by any of the chanr in the parameter g	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.32 RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



Looking downstream at Stream Reach 141-A. The reach was incised with areas of active erosion. The right and left riparian buffer consisted of 100% optimal canopy cover. The instream habitat consisted of leaf packs and substrate of various particle size but lacked riffle and pool complexes and had excess sediment and silt due to active erosion. The reach had no channel alterations

DESCRIBE PROPOSED IMPACT:	DE	SCR	BE I	PRO	POSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 02070010 3/04/2019 142-A 343 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JB/ WN/ JF S-142: AV1-22, AW1-14 **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.2 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.20 Left Bank Lt Bank CI > 1.10 1.15 1.1 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

30544.01 Martinsville Connector (VDOT) Henry R4 02070010 3/04/2019 142-A 343 N/A CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions,		St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, estock Conditional Category	Project #	Project Name (App	licant)	Locality		HUC	Date			-
Channel Alteration Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Channelization or hardening absent. Stream has an unaltered pattern or has naturalized. Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Channelization, dredging, alteration, or hardening absent. Stream has an unalterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander stream meander stream has been channelized, normal stable stream meander stream meander stream has been channelized, normal stable stream meander stream has an unaltered pattern or has naturalized.	30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	02070010	3/04/2019	142-A	343	N/A
Negligible Negligible Minor Moderate Severe	4. CHANNEI ivestock	L ALTERATION: Stream cross	ings, riprap, concr			traightening of cha	annel, channeliza	tion, embankmer		rictions,
Channel Alteration Channelization, dredging, alteration or hardening absent. Stream has an unaltered pattern or has naturalized. Channelization or hardening absent. Stream has an unaltered pattern or has naturalized. Channelization, dredging, alteration or hardening absent. Stream has an unaltered pattern or has naturalized. Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines. If the parameter guidelines. If the parameter guidelines. Stream has been channelized, normal stable stream meander stream has been channelized, normal stable stream meander stream stream stream stream steem stream str		Negligible	Mir			erate	Sev	/ere	NOTES>>	
recovered. recovered.	Channol		Less than 20% of the stream reach	20-40% of the stream reach is	is disrupted by any of the channel alterations listed in the parameter	is disrupted by any of the channel alterations listed in the parameter	Greater than 80% of	of reach is disrupted		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.19 RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



Looking upstream at Stream Reach 142-A. The reach had areas of active erosion. The right and left riparian buffer consisted of 100% suboptimal canopy cover due to recent logging activity. The instream habitat was marginal throughout the reach, lacking riffles, pools and leaf packs. The reach had no channel alterations.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 02070010 3/04/2019 143-A 303 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JB/ WN/ JF **Unnamed Tributary to Marrowbone Creek** S-143: AX1-17 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 50% 50% 100% Right Bank 0.85 Score > 1.2 CI= (Sum % RA * Scores*0.01)/2 60% 40% 100% Rt Bank CI > CI % Riparian Area> 1.03 Left Bank 0.85 Lt Bank CI > 1.00 1.01 1.1 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	02070010	3/04/2019	143-A	303	N/A
4. CHANNE ivestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of cha	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,
			Conditions	ai Calegory				NO I E2>>	
	Negligible	Mir	nor	Mod	erate	Sev	ere		
Channel Alteration	Negligible Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chann	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



he right riparian buffer consisted of 30-60% subpotimal canopy cover with a non-maintained understory. The left riparian buffer consisted of 30-60% subpotimal canopy cover with a non-maintained herbaceous understory and areas of denuded land due to recent logging activity. The instream habitat was marginal throughout the reach, lacking riffles, pools and leaf packs. The reach had no channel alterations. The reach had no channel alterations.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 02070010 3/04/2019 144-A 120 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JB/ WN/ JF **Unnamed Tributary to Marrowbone Creek** 144-A: AY11-24, AX17-20 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. 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Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 70% 30% 100% Right Bank Score > 1.5 1.1 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.38 Left Bank Lt Bank CI > 1.50 1.44 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	02070010	3/04/2019	144-A	120	N/A
4. CHANNE livestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,
	Negligible	Mir			erate	Sev	/ere	NOTES>>	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	is disrupted by any of the channel alterations listed in the parameter guidelines. If	ISU - 8U% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% of by any of the chang in the parameter g 80% of banks sh	of reach is disrupted		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



consisted of 30-60% subpotimal canopy cover with a non-maintained understory and areas of denuded surfaces due to recent logging activity. The left riparian buffer consisted of 100% optimal canopy cover. The instream habitat was marginal throughout the reach, lacking riffles, pools and leaf packs. The reach had no channel alterations.

DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 02070010 3/04/2019 145-A 626 N/A Stream Map S-145: BA1-36, BC1-25, Name(s) of Evaluator(s) Stream Name and Information JB/ WN/ JF **Unnamed Tributary to Marrowbone Creek** BB1-7 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe or Very little incision or active erosion: 8 ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative Poor. Banks more stable than Severe or Poor due to lower bank slopes. Erosion may be present on 40-60% of rosion or unprotected banks. Majority f banks are stable (60-80%). aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR naiority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present, AND/OR V AND/OR V-shaped channels have than 80% of stream bed is covered by shaped channels have vegetative protection on > 40% of the banks and vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 85% 15% 100% Right Bank Score > 1.5 1.1 CI= (Sum % RA * Scores*0.01)/2 95% 5% 100% Rt Bank CI > CI % Riparian Area> 1.44 Left Bank Lt Bank CI > 1.48 1.5 1.1 1.46 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.50

High

Score

1.5

	St	tream Ir	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	02070010	3/04/2019	145-A	626	N/A
4. CHANNEI livestock	L ALTERATION: Stream cross	ings, riprap, conc			traightening of ch	annel, channeliza	tion, embankmer		ictions,
	Negligible	Mi	nor	al Category Mod	erate	Sev	/ere	NOTES>>	
Channel Alteration	or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chang in the parameter g	of reach is disrupted tel alterations listed uidelines AND/OR ored with gabion, cement.		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



Looking and left riparian buffer consisted of 100% optimal canopy cover. The instream habitat consisted of leaf packs, riffle, pools and substrate of various particle size. The reach had no channel alterations.

)	E	SC	R	IBE	PR	ROF	209	SED	IMF	AC.	Γ:

Ephemeral Stream Assessment Form (Form 1a)

Unified Stream Methodology for use in Virginia

For use in ephemeral streams

Project #	Project Name	е	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R6	03010103	3/04/2019	146-A	23	N/A
Nam	e(s) of Evaluator(s)	Stream Nam	e and Informa	ation				Stream Map	
	JB/ WN/ JF	Unnamed Tr	ibutary to Ma	rrowbone Cr	eek			S-146: AZ2-4	, BA2-4

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

		Con	ditional Cate	gory			
	Optimal	Subo	ptimal	Mar	ginal	Po	oor
Riparian Buffers	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an non-maintained understory. Wetlands areas.	to 60% tree	with tree stratum (dbh > 3 inches) present, with >30% tree canopy	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surface row crops, activ feed lots, trails, other comparabl conditions.
		High	Low	High	Low	High	Low
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5

1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.

descriptors.

2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.

Enter the % Riparian Area and Score for each riparian category in the blocks below.

1.5

o. Litter the 70 ft	apanan Area and	Ocore for each in	dilair category in	the blocks below.		DIOCKS	quai 100
Right Bank	% Riparian Area>	40%	60%				100%
Right Bank	Score >	1.5	0.85				

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

THE REACH CONDITION INDEX (RCI) >> RCI= (Riparian CI)/2

Rt Bank CI >

Lt Bank CI >

NOTES>>

COMPENSATION REQUIREMENT (CR) >> N/A

CI= (Sum % RA * Scores*0.01)/2

1.11

1.50

CI

1.31

0.66

CR = RCI X LF X IF

Ensure the sums

of % Riparian

INSERT PHOTOS:



cover and 60% of non-maintained herbaceous understory with marginal canopy cover. The left riparian buffer consisted of 100% canopy cover.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 02070010 3/04/2019 146-B 64 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JB/ WN/ JF **Unnamed Tributary to Marrowbone Creek** S-146 AZ 4-6, BA 4-7 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 1.60 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 30% 70% 100% Right Bank 0.85 Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.05 Left Bank Lt Bank CI > 1.50 1.27 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	02070010	3/04/2019	146-B	64	N/A
4. CHANNE livestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer	NOTES>>	rictions,
	Negligible	Mir			erate	Sev	/ere	NO I LOSS	
Channel Alteration	or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is	is disrupted by any of the channel alterations listed in the parameter guidelines. If	of the channel alterations listed in	in the parameter g 80% of banks sh	of reach is disrupted		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2) COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



right riparian buffer consisted of 30% optimal canopy cover and 70% of non-maintained dense herbaceous understory with marginal canopy cover. The left riparian buffer consisted of 100% optimal canopy cover. The instream habitat was marginal throughout the reach and had substrate of various particle sizes and leaf packs. The reach had no channel alterations.

DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 02070010 3/04/2019 147-A 410 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JB/ WN/ JF S-147: BB7-23, BC25-41 **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 65% 35% 100% Right Bank 0.85 Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 15% 85% 100% Rt Bank CI > CI % Riparian Area> 1.27 Left Bank 0.85 Lt Bank CI > 0.95 1.11 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	02070010	3/04/2019	147-A	410	N/A
4. CHANNE ivestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of ch	annel, channeliza	ition, embankmer	nts, spoil piles, constr	rictions,
	Negligible	Mir			erate	Con	/ere	11012077	
				Wiou	ciale	36	/ere		
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chan in the parameter g		1	

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2) COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



Looking ups buffer consisted of 65% optimal canopy cover and 35% non-maintained herbaceous understory with marginal canopy cover due to recent logging activity. The left riparian buffer consisted of 15% canopy coverr and 85% non-maintained understory with marginal canopy cover due to recent logging activity. The instream habitat was marginal throughout the reach, lacking substrate of various particle sizes, leaf packs and shade. The reach had no channel alterations.

DESCRIBE	PROPOSED	IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 02070010 3/01/2019 148-A 196 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JB/ WN/ JF S-148: BD1-10, BE1-10 **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 3.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	02070010	3/01/2019	148-A	196	N/A
4. CHANNE livestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of cha	annel, channeliza	ition, embankmer	nts, spoil piles, const	rictions,
Negligible Minor Moderate Severe									
Channel Alteration	Channelization, dredging, alteration,	Less than 20% of the stream reach is disrupted by any	20-40% of the stream reach is	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter	is disrupted by any of the channel alterations listed in	Greater than 80% of	of reach is disrupted		
Alteration	or hardening absent. Stream has an unaltered pattern or has naturalized.	of the channel	of the channel alterations listed in the parameter guidelines.	guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	in the parameter g 80% of banks sh	nel alterations listed juidelines AND/OR ored with gabion, r cement.		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

N/A

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



Looking he right and left riparian buffer consisted of 100% optimal canopy cover. The instream habitat was marginal throughout the reach, lacking riffles, pools complexes. The reach had no channel alterations.

DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 02070010 4/26/2019 148-B 60 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-148: XK1-6, XL1-5 JF **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

0.90

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	02070010	4/26/2019	148-B	60	N/A
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock									
Conditional Category NOTES>>									
Negligible Minor Moderate Severe									
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	disrupted by any of the channel	is disrupted by any of the channel alterations listed in the parameter guidelines. If	is disrupted by any of the channel	Greater than 80% of by any of the chain in the parameter g 80% of banks sh riprap, or	nel alterations listed uidelines AND/OR ored with gabion,		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5	1	
	REACH C	CONDITION	NDEX and S	STREAM CO	NDITION UN	IITS FOR TH	IIS REACH	•	

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2) COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

N/A

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



and right bank riparian buffers consist of mature forests with greater than 60% tree canopy cover. Instream habitat present in 10-30% of the reach. No channel alteration present within the reach.

DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 02070010 3/04/2019 149-A 340 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JB/ WN/ JF S-149: BG1-21, BF1-28 **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 1.60 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

	St	ream Ir	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	02070010	3/04/2019	149-A	340	N/A
4. CHANNEL ivestock	ALTERATION: Stream cross	ings, riprap, conc		concrete blocks, s	traightening of ch	annel, channeliza		ts, spoil piles, constr	ictions,
	Negligible	Mi	nor		erate	Sev	/ere	NO I LOZZ	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is	of the channel	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not	Greater than 80% of by any of the chang in the parameter g 80% of banks sh	uidelines AND/OR		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.06

1.30

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2) COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

SCORE

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



Looking downstream at Stream Reach 149-A. The reach was moderately incised with areas of active erosion. The right and left riparian buffer consisted of 100% optimal canopy cover. The instream habitat was marginal throughout the reach, lacking riffles, pools complexes. The reach had minor channel alterations.

DESCRIBE	PROPOSED	IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 02070010 4/26/2019 149-B 54 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map JF **Unnamed Tributary to Marrowbone Creek** S-149: XM1-3, XN1-3 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

Channel Alteration Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Channelized in the parameter guidelines. Channelized in alterations listed in the parameter guidelines. Channelized in alterations listed in the parameter guidelines. Channelized in alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not patt	Stream Impact Assessment Form Page 2									
Channel Alteration Channel Alteration Alteration Alteration Alterations Isted in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not pattern has n	Project #	Project Name (App	licant)	Locality		HUC	Date	-	•	-
Channel Alteration Channel parameter guidelines. I will be parameter guidelines and be parame	30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	02070010	4/26/2019	149-B	54	N/A
Channel Alteration Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Channelization alterations listed in the parameter guidelines. If guidelines. If stream has been channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander guidelines. If stream has been channelized, normal stable stream meander pattern has not pattern has	1. CHANNEL ivestock	L ALTERATION: Stream cross	sings, riprap, conci			traightening of ch	annel, channeliza	ation, embankmer		rictions,
Channel Alteration Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander guidelines. If stream has been channelized, normal stable stream meander pattern has not stream has not stream meander pattern has not stream meander pattern has not stream meander pattern has not stream meander patte		Negligible	Mi			erate	Sev	vere	NOTES>>	
	Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander	Greater than 80% of by any of the chang in the parameter g	of reach is disrupted nel alterations listed guidelines AND/OR lored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



Looking downstream at Stream Reach 149-B. The stream is often incised with vegetative protection on 40-60% of the banks. The left and right riparian buffers consist of mature forest with greater than 60% tree canopy cover. Instream habitat is present in 30-50% of the stream reach. No channel alteration is present within the reach.

DESCRIBE PROPOSED IMPACT:	DE	SCR	BE	PRO	POSED	IMPACT
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 02070010 3/04/2019 150-A 484 N/A Stream Map S-150: BK1-10, BO1-6, Name(s) of Evaluator(s) Stream Name and Information JB/ WN/ JF **Unnamed Tributary to Marrowbone Creek** BN1-5 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Slightly incised, few areas of active Often incised, but less than Severe or Very little incision or active erosion: 8 ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR naiority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present, AND/OR V AND/OR V-shaped channels have than 80% of stream bed is covered by shaped channels have vegetative protection on > 40% of the banks and vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 80% 20% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.44 1.5 1.2 1.47 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.50

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	нис	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	02070010	3/04/2019	150-A	484	N/A
4. CHANNE livestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of ch	annel, channeliza	ition, embankmer	nts, spoil piles, constr	ictions,
	Negligible	Mir			erate	Sev	/ere	NO 12022	
				40 - 60% of reach	60 - 80% of reach				
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	is disrupted by any of the channel alterations listed in	in the parameter g 80% of banks sh	of reach is disrupted nel alterations listed juidelines AND/OR ored with gabion, r cement.		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



consisted of 100% optimal canopy cover. The left riparian buffer consisted of 80% canopy cover and 20% of less dense canopy cover. The instream habitat consisted of riffles, pools, leaf packs and substrate of various particle size. The reach had no channel alterations.

DESCRIBE	PROPOSED	IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 02070010 3/04/2019 151-A 63 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JB/ WN/ JF S-151: BQ1-4, BR1-4 **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 10% 90% 100% Right Bank Score > 1.5 1.1 CI= (Sum % RA * Scores*0.01)/2 95% 5% 100% Rt Bank CI > CI % Riparian Area> 1.14 Left Bank Lt Bank CI > 1.48 1.31 1.5 1.1 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

High

Score

1.5

Stream Impact Assessment Form Page 2													
Project #	Project Name (App	licant)	Locality Cowardin Class. HUC			Date SAR # / Data Point		Impact / SAR length	Impact Factor				
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	02070010	3/04/2019	151-A	63	N/A				
4. CHANNE livestock	L ALTERATION: Stream cross	ings, riprap, concr			traightening of cha	annel, channeliza	tion, embankmer		rictions,				
	Negligible	Mir		Conditional Category NOTES>>									
					ciate	361	/ere						
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chanr in the parameter g	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,						

THE REACH CONDITION INDEX (RCI) >>

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number. RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



10% optimal canopy cover and 90% suboptimal tree cover. The left riparian buffer consisted of 95% optimal canopy cover and 5% suboptimal suboptimal canopy cover. The instream habitat was marginal throughout the reach due to excess sediment and silt. The reach had minor channel alterations due to a culvert and an impoundment created online above this reach.

)	E	SC	R	IBE	PR	ROF	209	SED	IMF	AC.	Γ:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 02070010 3/04/2019 151-B 168 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JB/ WN/ JF S-151: BT7-16, BS7-16 **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.50

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	нис	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	02070010	3/04/2019	151-B	168	N/A
I. CHANNEI vestock	L ALTERATION: Stream cross	ings, riprap, concr			traightening of cha	annel, channeliza	ition, embankmer		ictions,
	No ali aible		Condition	al Category				NOTES>>	
				Mari		C-:		NO I LOSS	
	Negligible	Mir	nor		erate	Sev	/ere	NO 12022	
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chang in the parameter of	of reach is disrupted nel alterations listed juidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

N/A

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



Looking upstream at Stream Reach 151-B. The reach had optimal channel condition. The right and left riparian buffer consisted of 100% optimal canopy cover. The instream habitat throughout the reach consisted of riffles, pools, leaf packs and substrate of various particle size. The reach had no channel alterations.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 02070010 4/26/2019 151-C 63 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-151: XO1-5, XP1-5 JF **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. 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Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

0.90

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor	
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	02070010	4/26/2019	151-C	63	N/A
4. CHANNEI ivestock	L ALTERATION: Stream cross	ings, riprap, concr			traightening of cha	annel, channeliza	tion, embankmer		ictions,
	Negligible	Mir		al Category	erate	Sev	/ere	NOTES>>	
Channel Alteration	Negligible Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chanr in the parameter g	nei aiterations listed juidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

1.18

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



Looking downstream at Stream Reach 151-C. The stream is incised with erosion occuring on both stream banks. The left and right bank riparian buffers consist of mature forest with greater than 60% tree canopy cover. Instream habitat is present in 10-30% of the reach. No channel alteration is present with the stream reach.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 02070010 4/26/2019 151-D 130 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-151: BT7-16, BS7-16 JF **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 3.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 10% 45% 45% 100% Right Bank Score > 1.5 0.6 1.1 CI= (Sum % RA * Scores*0.01)/2 10% 90% 100% Rt Bank CI > CI % Riparian Area> 0.92 Left Bank Lt Bank CI > 0.69 0.80 1.5 0.6 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	02070010	4/26/2019	151-D	130	N/A
4. CHANNEI ivestock	L ALTERATION: Stream cross	ings, riprap, concr			traightening of ch	annel, channeliza	tion, embankmer		rictions,
			Conditiona	ol Category					
	Negligible	Mir		Mod		Sev	vere .	NOTES>>	
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is	Modisupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander	Greater than 80% of by any of the chann	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		
	Channelization, dredging, alteration, or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter	Mod 40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable	Greater than 80% of by any of the chanr in the parameter g	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

1.26

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



Looking downstream at Stream Reach 151-D. The stream has minimal incision and erosion with 80-100% vegetative surface protection. The left bank riparian buffer consists of a wetland and maintained lawn. The right bank riparian buffer consists of a wetland, maintained lawn, and forest with 30-60% tree canopy cover and maintained understory. Instream habitat is present in in 30-50% of the reach. Channel alteration is present in less than 20% of the reach due to a bridge.

DESCRIBE PROPOSED IMPACT:	DE	SCR	BE I	PRO	POSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R3 02070010 3/05/2019 152-A 414 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JB/ WN/ JF S-152: BV4-28, BW 3-25 **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	Henry	R3	02070010	3/05/2019	152-A	414	N/A	
4. CHANNEL livestock	_ ALTERATION: Stream cross	ings, riprap, concr			traightening of cha	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,
				al Category				NOTES>>	
	Negligible	Mir	nor		erate	Sev	ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chain in the parameter g 80% of banks sh riprap, or	nel alterations listed uidelines AND/OR ored with gabion,		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		
	REACH C	CONDITION	NDEX and S	STREAM CO	NDITION UN	IITS FOR TH	IS REACH		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



Lookin er consisted 100% optimal canopy cover. The instream habitat throughout the reach consisted of leaf packs and substrate of various particle size but lacked riffle and pool complexes. The reach had no channel alterations. consisted of

DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 152-B 30544.01 Martinsville Connector (VDOT) Henry R3 02070010 3/05/2019 210 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JB/ WN/ JF S-152: BV28-33, BW30-35 **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 3.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

0.90

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2			
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR Impact Ingth Factor		
30544.01	Martinsville Connecto	Henry	R3	02070010	3/05/2019	152-B	210	N/A		
4. CHANNEL livestock	L ALTERATION: Stream cross	ings, riprap, concr			traightening of cha	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,	
				al Category				NOTES>>		
	Negligible	Miı	nor		erate	Sev	/ere			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the parameter guidelines. If	is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chain in the parameter g 80% of banks sh riprap, or	nel alterations listed uidelines AND/OR ored with gabion,			
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5			
	REACH (CONDITION	NDEX and S	STREAM CO	NDITION UN	IITS FOR TH	IIS REACH	•		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2) COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



consisted of 100% optimal canopy cover. The instream habitat throughout the reach consisted of leaf packs but lacked substrate of various particle size and riffle and pool complexes. The reach had no channel alterations.

DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 152-C 30544.01 Martinsville Connector (VDOT) Henry R3 02070010 4/26/2019 56 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-152: XU10-12 JF **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. 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Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 3.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. 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Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	02070010	4/26/2019	152-C	56	N/A
4. CHANNEI ivestock	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of ch	annel, channeliza		nts, spoil piles, constr	ictions,
	Negligible	Mir			erate	Sev	/ere	NO 1 LOSS	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is disrupted by any of the channel alterations listed in	of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized.	Greater than 80% of by any of the change	nel alterations listed juidelines AND/OR		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.44 RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

1.50

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

0.5

INSERT PHOTOS:

SCORE

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



protection on the banks. The left and right bank riparian buffers consist of mature forest with greater than 60% tree canopy cover. Instream habitat is present in 30-50% of the stream. No channel alteration is present in this reach.

DESCRIBE PROPOSED IMPACT:	DE	SCR	BE I	PRO	POSED	IMPACT:
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Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 152-D 30544.01 Martinsville Connector (VDOT) Henry R3 02070010 4/26/2019 40 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-152: XU1-10 JF **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 80% 20% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.42 1.5 1.46 1.1 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	02070010	4/26/2019	152-D	40	N/A
4. CHANNEI	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of cha	annel, channeliza	ition, embankmer	nts, spoil piles, const	trictions,
	Negligible	Mir			erate	Sev	/ere	11012077	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	is disrupted by any of the channel alterations listed in	by any of the chang in the parameter g 80% of banks sh	of reach is disrupted	I	

THE REACH CONDITION INDEX (RCI) >>

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2) N/A

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



bank riparian buffer consists of mature forest with greater than 60% tree canopy cover. The right bank riparian buffer consists of mature forest with greater than 60% tree canopy cover and portions of mature forest with a maintained understory. Instream habitat is present in 30-50% of the stream. No channel alteration is present in this reach.

DESCRIBE	PROPOSED	IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 02070010 3/05/2019 153-A 37 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JB/ WN/ JF S-153: BW25-30 **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient** CI

0.9

0.5

0.90

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (Applicant) Locality Cowardin Class. HUC Date SAR # / Impact / SAR Impact / Factor								
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	02070010	3/05/2019	153-A	37	N/A
4. CHANNE livestock	L ALTERATION: Stream cross	ings, riprap, concr			traightening of ch	annel, channeliza	tion, embankmer		rictions,
	Conditional Category							NOTES>>	
	Negligible	Mir	nor	Mod	erate	Sev	ere		
Channel Alteration	Negligible Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	of the channel alterations listed in	Greater than 80% of by any of the chant	nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



Looking bank. The right and left riparian buffer consisted of 100% optimal canopy cover. The instream habitat throughout the reach consisted of leaf packs but lacked substrate of various particle size and riffle and pool complexes. The reach had concrete blocks and metal in streambed.

DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 02070010 3/05/2019 154-A 367 N/A Name(s) of Evaluator(s) Stream Name and Information Stream Map JB/ WN/ JF S-154: BX1-27, BY1-15 **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

	St	ream Ir	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (Applicant) Locality Cowardin Class. HUC Date SAR # / Data Point Impact / SAR Impact Factor								
30544.01	Martinsville Connecto	Martinsville Connector (VDOT) Henry R4 02070010 3/05/2019 154-A 367 N/A							
4. CHANNEL livestock	ALTERATION: Stream cross	ings, riprap, conc			traightening of cha	annel, channeliza	tion, embankmer		rictions,
	March 2011			al Category				NOTES>>	
	Negligible	Mi	nor		erate	Severe			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the parameter guidelines. If	of the channel alterations listed in	by any of the chanr	nel alterations listed uidelines AND/OR ored with gabion,		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		
	REACH C	CONDITION	NDEX and S	STREAM CO	NDITION UN	IITS FOR TH	IS REACH		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



Looking up consisted of 100% optimal canopy cover. The instream nabital throughout the reach consisted of leaf packs and substrate of various particle size but lacked riffle and pool complexes. The reach had no channel alterations.

DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 154-B 30544.01 Martinsville Connector (VDOT) Henry R3 02070010 3/05/2019 64 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map JF **Unnamed Tributary to Marrowbone Creek** S-154: XF1-6, XG1-6 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen further. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Erosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the riparian to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.50

High

Score

1.5

	St	ream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	or (VDOT)	Henry	R3	02070010	3/05/2019	154-B	64	N/A
4. CHANNEL	L ALTERATION: Stream cross	ings, riprap, concr		concrete blocks, s	traightening of ch	annel, channeliza	tion, embankmer	nts, spoil piles, const	trictions,
Negligible Minor				Moderate					
	Negligible	Mii	nor			Sev	ere		
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	is disrupted by any of the channel alterations listed in	Greater than 80% of by any of the chann	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



Looking do and right bank riparian buffers consist of mature forests with greater than 60% tree canopy cover. Instream habitat is present in greater than 60% of the reach. No channel alteration is present within this reach. The left

DESCRIBE PROPOSED IMPACT:

Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia

	For use in epitemeral streams									
Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor		
30544.01	Martinsville Connector (VDOT)	Henry	R6	03010103	4/26/2019	155-A	291	N/A		
NI	(-) - (F (-) O(N	I lee C					10.			

Name(s) of Evaluator(s) Stream Name and Information **Unnamed Tributary to Marrowbone Creek** S-155: XD1-13, XE1-13

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

		Con	ditional Cate	gory			
	Optimal	Subo	ptimal	Mar	ginal	Po	oor
Riparian Buffers	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an non-maintained understory. Wetlands areas.	to 60% tree	with tree stratum (dbh > 3 inches) present, with >30% tree canopy	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces row crops, active feed lots, trails, o other comparable conditions.
		High	Low	High	Low	High	Low
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5

Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the

descriptors. 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you

3. Enter the % Riparian Area and Score for each riparian category in the blocks below.

% Riparian Area> 100% 100% Right Bank Score > 1.5

100% % Riparian Area> Left Bank 1.5

THE REACH CONDITION INDEX (RCI) >> 0.75 RCI= (Riparian CI)/2

CI= (Sum % RA * Scores*0.01)/2

1.50

1.50

CI

1.50

COMPENSATION REQUIREMENT (CR) >> N/A

Rt Bank CI >

Lt Bank CI >

NOTES>>

CR = RCI X LF X IF

Ensure the sums

of % Riparian

Blocks equal 100

INSERT PHOTOS:



REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

forests with greater than 60% tree canopy cover.

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR#/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 02070010 4/26/2019 156-A 29 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map S-156: XJ1-7 JF **Unnamed Tributary to Marrowbone Creek** 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained, High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (Applicant) Locality Cowardin Class. HUC Date SAR # / Impact / SAR Impact / Factor								
30544.01	Martinsville Connecto	or (VDOT)	Henry	R4	02070010	4/26/2019	156-A	29	N/A
4. CHANNE livestock	L ALTERATION: Stream cross	ings, riprap, conci			traightening of ch	annel, channeliza	tion, embankmer		rictions,
	Negligible	Mir	Conditiona nor	al Category	erate	Sev	vere	NOTES>>	
				40 - 60% of reach	60 - 80% of reach			1	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is	of the channel alterations listed in the parameter guidelines. If	is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	in the parameter g 80% of banks sh	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion, cement.	1	

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



Looking do and right bank riparian buffers consist of mature forests with greater than 60% tree canopy cover. Instream habitat is present in 30-50% of the reach. No channel alteration is present within this reach. The left

DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 02070010 4/26/2019 157-A 39 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map JF **Unnamed Tributary to Marrowbone Creek** S-157: XQ1-3, XR1-3 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2.00 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool complexes Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

	St	tream In	npact A	ssessn	nent Fo	rm Pag	e 2		
Project #	Project Name (App	licant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor
30544.01	Martinsville Connecto	Martinsville Connector (VDOT) Henry R4 02070010 4/26/2019 157-A							
4. CHANNE livestock	L ALTERATION: Stream cross	sings, riprap, conc			traightening of cha	annel, channeliza	tion, embankmer	nts, spoil piles, const	rictions,
	Negligible	Negligible Mi			Conditional Category Moderate			NO I ES>>	
				iliou	Ciato	36	rere		
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	is disrupted by any of the channel	Greater than 80% of by any of the chang in the parameter of	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

COMPENSATION REQUIREMENT (CR) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\30000s\30500\30544.01\Admin\05-ENVR\TEMPLATE-UPLOADS\TEAM #1\ALIGNMENT 4B\PH



Looking do riparian buffers consist of mature forests with greater than 60% tree canopy the reach. No channel alteration is present within this reach.

DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia use in wadeable channels classified as intermittent or perennial SAR #/ Impact/SAR Cowardin Impact **Project Name (Applicant)** Project # Locality HUC **Data Point** Class Length **Factor** 30544.01 Martinsville Connector (VDOT) Henry R4 03010103 04/26/2019 158-A 262 N/A Stream Name and Information Name(s) of Evaluator(s) Stream Map JF Tributary of Marrowbone Creek S-158: Approximate 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Optimal Suboptimal Marginal Poor Severe Often incised, but less than Severe or Very little incision or active erosion: 8 Slightly incised, few areas of active ened/incised. Vertically / Deeply incised (or excavated) 100% stable banks. Vegetative rosion or unprotected banks. Majority f banks are stable (60-80%). Poor. Banks more stable than Severe or Poor due to lower bank slopes. aterally unstable. Likely to widen urther. Majority of both banks ar vertical/lateral instability. Severe ncision, flow contained within the surface protection or natural rock, prominent (80-100%). AND/OR Stable Channel Frosion may be present on 40-60% of egetative protection or natural rock near vertical. Erosion present on 60anks. Streambed below average Condition both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR panks. Vegetative protection present on 20-40% of banks, and is insufficier to prevent erosion. AND/OR 60-80% ankfull benches are present. Access prominent (60-80%) AND/OR najority of banks vertical/undercut. o their original floodplain or fully Depositional features contribute to stability. The bankfull and low flow /egetative protection present on less han 20% of banks, is not preventing developed wide bankfull benches channel hars and transverse hars few hannels are well defined. Stream 40-60% Sediment may be temporary the stream is covered by sediment. erosion. Obvious bank sloughing Transient sediment deposition covers less than 10% of bottom. ikely has access to bankfull penches,or newly developed ransient, contribute instability. Deposition that contribute to stability. Sediment is temporary / transient in nature, and contributing to instability resent Frosion/raw banks on 80-100%. AND/OR Aggrading channel portions of the reach. Transient sediment covers 10-40% of the stream bottom. may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and AND/OR V-shaped channels have than 80% of stream bed is covered by vegetative protection is present on > 40% of the banks and stable sedimen deposition, contributing to instability. Multiple thread channels and/or epositional features which contribute deposition is absent. subterranean flow. CI stability. Score 3 2.4 2 1.6 2 40 NOTES>> 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Poor Optimal Suboptimal Marginal Low Marginal High Poor: ow Suboptimal Non-maintained High Suboptima Lawns, mowed Riparian areas High Marginal: ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceou vegetation, with tree stratum areas, nurseries Impervious riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine resent, with 30% vegetation with acking shrub and Free stratum (dbh > 3 inches) presei resent with 30% actively grazed spoil lands to 60% tree either a shrub layer or a tree tree stratum, hay production, ponds Riparian with > 60% tree canopy cover. Wetlands located within the ripariar to 60% tree nuded surface asture, sparsely Buffers canopy cover and vegetated nonrow crops, active a maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, o understory. Recent cutover inches) present with <30% tree present, tree stratum (dbh >3 other comparable conditions. shrub layers or a and stabilized, or (dense canopy cover inches) present non-maintained other comparable vegetation). with <30% tree understory condition. canopy cover wit maintained nderstor High Low High High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area: 100% 100% Right Bank Score > 1.5 CI= (Sum % RA * Scores*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.50 Left Bank Lt Bank CI > 1.50 1.50 1.5 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; Conditional Category NOTES>> Instream Optimal Suboptimal Marginal Poor Habitat/ Habitat elements listed above are Stable habitat elements are typically Stable habitat elements are typically Available Habitat elements are typically preser present in 10-30% of the reach and present in 30-50% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less populations. than 10% of the reach. populations. **Stream Gradient**

0.9

0.5

1.20

High

Score

1.5

	Stream Impact Assessment Form Page 2												
Project #	Project Name (Applicant)	Locality	Cowardin Class.	HUC	Date	SAR # / Data Point	Impact / SAR length	Impact Factor					
30544.01	Martinsville Connector (VDOT)	Henry	R4	03010103	04/26/2019	158-A	262	N/A					
4. CHANNEL livestock	4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, iivestock												
	Conditional Category NOTES>>												

	Negligible	Minor		Moderate		Severe
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in the parameter guidelines. If	80 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks shored with gabion, riprap, or cement.
SCORE	1.5	1.3	1.1	0.9	0.7	0.5

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

1.32

CI 1.50

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >> N/A

CR = RCI X LF X IF

INSERT PHOTOS:

(WSSI Photo Location L:\9999.01\Images\Stream Assessment\IMG_2733.jpg)



Looking downstream at Stream Reach 158-A. The stream has slight incision with 60-80% vegetative surface protection on the banks. The left and right bank riparian buffers consist of wetlands and mature forest with greater than 60% tree canopy cover. Instream habitat is present in 30-50% of the stream. Channel alteration is not present in the reach.