r			a. 10.0.0. 2	
USACE AID #:			NCDWR #:	
	3: Attach a sketch of the assessment			
	cation of the stream reach under eva			
number all reac	nes on the attached map, and include	a separate form for each	h reach. See the NC SAM U	ser Manual for detailed descriptions
	s of requested information. Record i			rements were performed. See the
NC SAM User N	lanual for examples of additional mea	surements that may be	relevant.	
NOTE EVIDEN	E OF STRESSORS AFFECTING TI	HE ASSESSMENT ARE	A (do not need to be within	the assessment area).
PROJECT/SITE	INFORMATION:			
1. Project name	(if any): U-5706 Falling Creek	west 2. Da	ate of evaluation: 7/12/20	18
3. Applicant/owi	er name: NCDOT	4. As	ssessor name/organization:	A.Keith/Axiom
5. County:	Rockingham		earest named water body	
7. River basin:	Yadkin-PeeDee		n USGS 7.5-minute quad:	Falling Creek
8. Site coordina	es (decimal degrees, at lower end of		34.938082 -79.753796	
	RMATION: (depth and width can be	· · · · · · · · · · · · · · · · · · ·		
			h of assessment reach evalua	ated (feet): 100
	th from bed (in riffle, if present) to top			nable to assess channel depth.
	th at top of bank (feet): 10-20		sment reach a swamp steam	? □Yes ⊠No
	: Perennial flow Intermittent flo			
	GORY INFORMATION:			
15. NC SAM Zo	_ ·	☐ Piedmont (P)		Outer Coastal Plain (O)
	_	_	_	
40 Fatimanta da		1		
16. Estimated g valley shape		\	□в	
Tidal Marsh		nm, flatter valley slope)	(less sinuous str	eam, steeper valley slope)
	<u> </u>		•	
17. Watershed	ırsh Stream)	Size 2 (0.1 to < 0	.5 mi ²) \square Size 3 (0.5 to <	5 mi²) ⊠Size 4 (≥ 5 mi²)
ADDITIONAL II	,			
	tory considerations evaluated? ⊠Ye	s Mo If You chack	all that apply to the assessme	nt area
Section 1				shed (
	Fish Habitat Primary Nu			/Outstanding Resource Waters
_		iparian buffer rule in effe	•	<u> </u>
☐ Anadrom		ipanan banci raic in on		onmental Concern (AEC)
_	ted presence of a federal and/or state	e listed protected specie		
List spec	-			
	ed Critical Habitat (list species)			
	al stream information/supplementary	measurements included	in "Notes/Sketch" section or	attached? ⊠Yes □No
	,,			
1. Channel Wa	ter – assessment reach metric (ski	p for Size 1 streams a	nd Tidal Marsh Streams)	
	ter throughout assessment reach.			
□B No	flow, water in pools only.			
□C No	water in assessment reach.			
2. Evidence of	Flow Restriction - assessment rea	ach metric		
			ol sequence is severely affect	cted by a flow restriction or fill to the
				impoundment on flood or ebb within
				the channel, tidal gates, debris jams,
	aver dams).			
⊠B No	: A			
3. Feature Pat	ern – assessment reach metric			
	najority of the assessment reach has	altered pattern (example	es: straightening, modification	above or below culvert).
⊠B No		anoroa panom (oxampi	oo. oa.g.n.o.m.g, moamoano.	rabovo or bolow darvorty.
	gitudinal Profile – assessment rea		<i>c</i> :	
				lown-cutting, existing damming, over
	ening, active aggradation, dredging, :urbances).	and excavation where	appropriate channel profile	has not reformed from any of these
□B No	,			
	• •			
5. Signs of Ac				
_	ive Instability – assessment reach			
Consider of	ly current instability, not past eve	ents from which the st		red. Examples of instability include
Consider of active bank	aly current instability, not past ever ailure, active channel down-cutting (h	ents from which the st		
Consider of active bank : ☐A < 1	ly current instability, not past eve	ents from which the st		

6.	. Streamside Area Interaction – streamside area metric Consider for the Left Bank (LB) and the Right Bank (RB).									
	Cons LB	rider for t RB	ne Left	Bank (LB	s) and the	Right Ba	nk (RB).			
	□A ⊠B	∏A ⊠B	Mod refe	derate evi erence inte	dence of ceraction (ex	conditions xamples:	limited streams	rms, leve ide area a	es, down- ccess, dis	cutting, aggradation, dredging) that adversely affect ruption of flood flows through streamside area, leaky
	or intermittent bulkheads, causeways with floodplain constriction, minor ditching [including mosquito ditching]) Extensive evidence of conditions that adversely affect reference interaction (little to no floodplain/intertidal zone access [examples: causeways with floodplain and channel constriction, bulkheads, retaining walls, fill, stream incision, disruption of flood flows through streamside area] or too much floodplain/intertidal zone access [examples: impoundments, intensive mosquito ditching]) or floodplain/intertidal zone unnaturally absent or assessment reach is a man-made feature on an interstream divide						eraction (little to no floodplain/intertidal zone access heads, retaining walls, fill, stream incision, disruption lal zone access [examples: impoundments, intensive			
7.	Wate	r Quality	Stresso	ors – asse	essment r	each/inte	ertidal zone me	tric		
	Chec	k all that	apply.							
	□A ⊠B						ne (milky white, m features or int			er discoloration, oil sheen, stream foam)
	\Box C	Notic	eable ev	idence of	pollutant	discharge				nd causing a water quality problem
	□D □E				ural sulfide		ating degraded	water dua	lity in the	assessment reach. Cite source in "Notes/Sketch"
		section	on.					water qua	inty iii tiio	assessment reach. One source in Protosychotem
	□F □G				to stream o eam or inte					
	\Box H	Degr	aded ma	arsh veget	tation in the	e intertida	l zone (removal			nowing, destruction, etc)
	⊠I □J		r: to no st			_ (explain	in "Notes/Sketo	ch" sectior	ר)	
8.					netric (ski	in for Tida	al Marsh Strea	ms)		
	For S	ize 1 or 2	streams	s, D1 drou	ght or high	er is cons	sidered a drough	nt; for Size	3 or 4 str	eams, D2 drought or higher is considered a drought.
	□A □B						III not exceeding 1 inch within the			st 48 hours
	⊠c			onditions	_	3				
9.	Large □Ye	•	•		assessme			f Yes, skip	to Metric	: 13 (Streamside Area Ground Surface Condition).
10.							each metric			
	10a.	⊠Yes	□No	sedime	ntation, m	iining, exc		eam harde	ening [for	nt reach (examples of stressors include excessive example, rip-rap], recent dredging, and snagging) to Metric 12)
	10b.	Check a □A					e of assessmen quatic mosses		skip for S	ize 4 Coastal Plain streams) 5% oysters or other natural hard bottoms
			(include	e liverwort	ts, lichens,	and algal	l mats)	Check for Tidal Marsh Streams Only	□G	Submerged aquatic vegetation
		□В	Multiple vegetat		nd/or leaf _l	packs and	d/or emergent	k for h Stre	□H □I	Low-tide refugia (pools) Sand bottom
		□с	Multiple	e snags ar	nd logs (in			Check Marsh	□J	5% vertical bank along the marsh
		□D					s and/or roots d perimeter	0 2	□K	Little or no habitat
		□E		no habita			,			
****	******	*****	*****	**REMAIN	NING QUE	STIONS	ARE NOT APP	LICABLE	FOR TID	AL MARSH STREAMS************************************
										streams and Tidal Marsh Streams)
	11a.	□Yes	□No	Is asses	sment read	ch in a na	tural sand-bed	stream? (s	skip for C	oastal Plain streams)
	11b.				k the app		oox(es).			
		⊠a ⊠B			ı (evaluate n (evaluat					
		□c					tric 12, Aquatio	: Life)		
	11c.	at least	one box	in each r	row (skip	for Size 4	Coastal Plain	streams	and Tidal	essment reach – whether or not submerged. Check Marsh Streams) . Not Present (NP) = absent, Rare Predominant (P) = > 70%. Cumulative percentages
					or each as					•
					Ô		Bedrock/sapre	olite		
							Boulder (256 Cobble (64 –		m)	
				Ħ			Gravel (2 – 64	4 mm)		
				吕			Sand (.062 – Silt/clay (< 0.0			
				Ħ		Ĭ	Detritus			
			_		_		Artificial (rip-ra	•	. ,	
	11d.	□Yes	□No	Are pool	s filled with	h sedimer	it? (skip for Siz	ze 4 Coas	tal Plain s	streams and Tidal Marsh Streams)

12.	-		ssessment reach metric (skip for Tidal Marsh Streams)
	12a. ⊠ If N	_	No Was an in-stream aquatic life assessment performed as described in the User Manual? tone of the following reasons and skip to Metric 13. No Water Other:
	12b. 🛚	Yes [No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.
	1 <u> </u>		Adult frogs
			Aquatic reptiles Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats)
]Beetles]Caddisfly larvae (T)
			Asian clam (<i>Corbicula</i>)
]Crustacean (isopod/amphipod/crayfish/shrimp)]Damselfly and dragonfly larvae
			Dipterans Dipterans
]Mayfly larvae (E)]Megaloptera (alderfly, fishfly, dobsonfly larvae)
]Midges/mosquito larvae
]Mosquito fish (<i>Gambusia</i>) or mud minnows (<i>Umbra pygmaea)</i>]Mussels/Clams (not <i>Corbicula</i>)
		\triangleright	Other fish
]Salamanders/tadpoles]Snails
			Stonefly larvae (P)
]Tipulid larvae]Worms/leeches
13.	Conside	r for the	a Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types) Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff.
	LB □A	RB □A	Little or no alteration to water storage capacity over a majority of the streamside area
	∏в ⊠С	⊠B □C	Moderate alteration to water storage capacity over a majority of the streamside area Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction,
		ПС	livestock disturbance, buildings, man-made levees, drainage pipes)
14.			Water Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Left Bank (LB) and the Right Bank (RB) of the streamside area.
	□A ⊠B □C	□A □B ⊠C	Majority of streamside area with depressions able to pond water ≥ 6 inches deep Majority of streamside area with depressions able to pond water 3 to 6 inches deep Majority of streamside area with depressions able to pond water < 3 inches deep
15.	Conside	r for the	ce – streamside area metric (skip for Tidal Marsh Streams) Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the normal of assessment reach.
	LB	RB	
	⊠Y □N	⊠Y □N	Are wetlands present in the streamside area?
16.	Baseflo	w Contri	butors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams)
	Check a ☐A		butors within the assessment reach or within view of <u>and</u> draining to the assessment reach. s and/or springs (jurisdictional discharges)
	⊠B	Ponds (include wet detention basins; do not include sediment basins or dry detention basins)
	⊠c ⊠d		tion passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir) te of bank seepage or sweating (iron in water indicates seepage)
	⊠E	Stream	bed or bank soil reduced (dig through deposited sediment if present)
17	□F Baseflox		the above tors – assessment area metric (skip for Tidal Marsh Streams)
•••	Check a	II that a	oply.
	∐A ⊠B		e of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation) tion not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit)
	⊠c	Urban s	tream (≥ 24% impervious surface for watershed)
	⊠D □E		the that the streamside area has been modified resulting in accelerated drainage into the assessment reach ment reach relocated to valley edge
	□F		the above
18.			ssment reach metric (skip for Tidal Marsh Streams)
	$\square A$	Stream	Consider "leaf-on" condition. shading is appropriate for stream category (may include gaps associated with natural processes)
	□в ⊠С		ed (example: scattered trees) shading is gone or largely absent
		J Juil	

19.	Buffer Width – streamside area metric (skip for Tidal Marsh Streams) Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out to the first break. Vegetated Wooded LB RB LB RB $\triangle A \triangle A$
20.	Buffer Structure – streamside area metric (skip for Tidal Marsh Streams) Consider for left bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width). LB RB A Mature forest B Non-mature woody vegetation or modified vegetation structure C C Herbaceous vegetation with or without a strip of trees < 10 feet wide D D Maintained shrubs E Little or no vegetation
21.	Buffer Stressors – streamside area metric (skip for Tidal Marsh Streams) Check all appropriate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is within 30 feet of stream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet). If none of the following stressors occurs on either bank, check here and skip to Metric 22: Abuts < 30 feet 30-50 feet LB RB LB RB LB RB A A A A A A A A A A A A A A A A A A A
22.	Stem Density – streamside area metric (skip for Tidal Marsh Streams) Consider for left bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width). LB RB A Medium to high stem density B B Low stem density C C No wooded riparian buffer or predominantly herbaceous species or bare ground
23.	Continuity of Vegetated Buffer – streamside area metric (skip for Tidal Marsh Streams) Consider whether vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide. LB RB A The total length of buffer breaks is < 25 percent. B B B The total length of buffer breaks is between 25 and 50 percent. C C The total length of buffer breaks is > 50 percent.
24.	Vegetative Composition – streamside area metric (skip for Tidal Marsh Streams) Evaluate the dominant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to assessment reach habitat. LB RB □A Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species, with non-native invasive species absent or sparse. □B Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or communities with non-native invasive species present, but not dominant, over a large portion of the expected strata or communities missing understory but retaining canopy trees. □C □C Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent or communities with non-native invasive species dominant over a large portion of expected strata or communities composed of planted stands of non-characteristic species or communities inappropriately composed of a single species or no vegetation.
25.	Conductivity – assessment reach metric (skip for all Coastal Plain streams) 25a. ☐ Yes ☐ No Was conductivity measurement recorded? If No, select one of the following reasons. ☐ No Water ☐ Other: 25b. Check the box corresponding to the conductivity measurement (units of microsiemens per centimeter). ☐ A < 46 ☐ B 46 to < 67 ☐ C 67 to < 79 ☐ D 79 to < 230 ☐ E ≥ 230

Portion of Falling Creek below Hinson Lake and below beaver impoundment. West side of Long Drive. This section of Falling Creek has development on left and right bank.

Stream Site Name	U-5706,Falling Creek-west	Date of Assessment	7/12/2018				
Stream Category	la4	Assessor Name/Organization	A.Keith/Axiom				
Notes of Field Asses	sment Form (Y/N)		YES				
Presence of regulator	resence of regulatory considerations (Y/N) NO						
Additional stream inf	ormation/supplementary measu	rements included (Y/N)	YES				
NC SAM feature type	e (perennial, intermittent, Tidal N	Marsh Stream)	Perennial				

q · · · · · · · · · · · · · · · · · · ·		
Function Class Rating Summary	USACE/ All Streams	NCDWR Intermittent
(1) Hydrology	LOW	mitermittent
(2) Baseflow	HIGH	
(2) Flood Flow	LOW	
(3) Streamside Area Attenuation	LOW	
(4) Floodplain Access	MEDIUM	
(4) Wooded Riparian Buffer	LOW	
(4) Microtopography	LOW	
(3) Stream Stability	MEDIUM	
(4) Channel Stability	MEDIUM	
(4) Sediment Transport	NA	
(4) Stream Geomorphology	MEDIUM	
(2) Stream/Intertidal Zone Interaction	NA	
(2) Longitudinal Tidal Flow	NA	
(2) Tidal Marsh Stream Stability	NA	
(3) Tidal Marsh Channel Stability	NA	
(3) Tidal Marsh Stream Geomorphology	NA	
(1) Water Quality	MEDIUM	
(2) Baseflow	HIGH	
(2) Streamside Area Vegetation	HIGH	
(3) Upland Pollutant Filtration	HIGH	
(3) Thermoregulation	LOW	
(2) Indicators of Stressors	YES	
(2) Aquatic Life Tolerance	LOW	
(2) Intertidal Zone Filtration	NA NA	
(1) Habitat	LOW	
(2) In-stream Habitat	MEDIUM	
(3) Baseflow	HIGH	
(3) Substrate	NA NA	
(3) Stream Stability	MEDIUM	
	MEDIUM	
(3) In-stream Habitat		
(2) Stream-side Habitat	LOW	
(3) Stream-side Habitat	LOW	
(3) Thermoregulation	LOW	
(2) Tidal Marsh In-stream Habitat	NA NA	
(3) Flow Restriction	NA NA	
(3) Tidal Marsh Stream Stability	NA	
(4) Tidal Marsh Channel Stability	NA	
(4) Tidal Marsh Stream Geomorphology	NA	
(3) Tidal Marsh In-stream Habitat	NA	
(2) Intertidal Zone	NA	
Overall	LOW	

USACE AID #:			NCDWR #:	
				7.5-minute topographic quadrangle,
				on the same property, identify and
				ser Manual for detailed descriptions
				urements were performed. See the
NC SAM User Manual for ex				
NOTE EVIDENCE OF STRE	SSORS AFFECTING THE	ASSESSMENT AR	EA (do not need to be within	n the assessment area).
PROJECT/SITE INFORMAT	ION:			
1. Project name (if any):	U-5706, Stream SA		Date of evaluation: 7/12/20	_
3. Applicant/owner name:	NCDOT	4. /	Assessor name/organization:	A.Keith/Axiom
5. County:	Rockingham		Nearest named water body	
7. River basin:	Yadkin-PeeDee		on USGS 7.5-minute quad:	Falling Creek
8. Site coordinates (decimal	degrees, at lower end of ass	sessment reach):	34.930911 -79.727539	
STREAM INFORMATION: (c		pproximations)		
9. Site number (show on atta			gth of assessment reach evalu	ated (feet): 100
11. Channel depth from bed	(in riffle, if present) to top of	f bank (feet): 1-	<u>2</u>	Inable to assess channel depth.
12. Channel width at top of b			essment reach a swamp steam	i? □Yes ⊠No
14. Feature type: ☐Perenni		☐Tidal Marsh Stre	eam	
STREAM CATEGORY INFO	-	_	_	
15. NC SAM Zone:	☐ Mountains (M)	☐ Piedmont (P)		Outer Coastal Plain (O)
			\	/
16. Estimated geomorphic				
valley shape (skip for	⊠a `		□В	
Tidal Marsh Stream):	(more sinuous stream,	, flatter valley slope)	(less sinuous sti	ream, steeper valley slope)
17. Watershed size: (skip	☐Size 1 (< 0.1 mi²)	Size 2 (0.1 to <	0.5 mi ²)	5 mi²)
for Tidal Marsh Stream)	1			
ADDITIONAL INFORMATIO	N:			
			all that apply to the assessme	
Section 10 water	☐Classified Tro			shed (I II III IV V)
Essential Fish Habitat				s/Outstanding Resource Waters
Publicly owned proper		arian buffer rule in e		
☐Anadromous fish	□303(d) List	oto d muoto oto d om o o		onmental Concern (AEC)
-	of a federal and/or state ils	stea protectea spec	ies within the assessment area	A
List species: ☐Designated Critical Ha	hitat (list aposics)			
_		acuromente include	ed in "Notes/Sketch" section or	attached? ⊠Yes □No
19. Are additional stream into	mation/supplementary me	asurements include	ed III Notes/Sketcii Section of	attached: Mies Livo
1. Channel Water – assess	ment reach metric (skip f	for Size 1 streams	and Tidal Marsh Streams)	
	ut assessment reach.		,	
☐B No flow, water in				
☑C No water in asset	essment reach.			
2. Evidence of Flow Restri	ction - assessment reach	n metric		
			ond sequence is severely affer	cted by a flow restriction or fill to the
				impoundment on flood or ebb within
				the channel, tidal gates, debris jams,
beaver dams).	` .	·	,	
⊠B Not A				
3. Feature Pattern – asses	sment reach metric			
		ered pattern (exami	oles: straightening, modification	n above or below culvert).
⊠B Not A		oroa parrorri (oxarri	g,g,	
	ofile accessment result	motrio		
	ofile - assessment reach		m nyafila (ayamalaa) ahannal a	down authing avioting domining aver
				down-cutting, existing damming, over
disturbances).	aggradation, diedging, an	ia excavation wilet	c appropriate charmer profile	has not reformed from any of these
⊠B Not A				
		-4		
_	ty - assessment reach me		otroom has summerable masses	Examples of instability in all 1
				ered. Examples of instability include uch as concrete, gabion, rip-rap).
⊠A < 10% of chann		iu-cuij, active widen	ing, and animolal natuening (St	uon as concrete, gabion, np-rap).
☐B 10 to 25% of ch				
☐C > 25% of chann				

0.			ne Left Bank (LB) and the Right Bank (RB).				
	LB	RB					
	⊠a □B	⊠A □B	Little or no evidence of conditions that adversely affect reference interaction Moderate evidence of conditions (examples: berms, levees, down-cutting, aggradation, dredging) that adversely affect reference interaction (examples: limited streamside area access, disruption of flood flows through streamside area, leaky or intermittent bulkheads, causeways with floodplain constriction, minor ditching (including mosquite ditching)				
	or intermittent bulkheads, causeways with floodplain constriction, minor ditching [including mosquito ditching]) Extensive evidence of conditions that adversely affect reference interaction (little to no floodplain/intertidal zone access [examples: causeways with floodplain and channel constriction, bulkheads, retaining walls, fill, stream incision, disruption of flood flows through streamside area] or too much floodplain/intertidal zone access [examples: impoundments, intensive mosquito ditching]) or floodplain/intertidal zone unnaturally absent or assessment reach is a man-made feature on an interstream divide						
7.	Wate	r Quality	Stressors – assessment reach/intertidal zone metric				
		k all that					
	ΠA		lored water in stream or intertidal zone (milky white, blue, unnatural water discoloration, oil sheen, stream foam)				
	В		sive sedimentation (burying of stream features or intertidal zone)				
	□ C Noticeable evidence of pollutant discharges entering the assessment reach <u>and</u> causing a water quality problem □ D Odor (not including natural sulfide odors)						
	□E	Curre	nt published or collected data indicating degraded water quality in the assessment reach. Cite source in "Notes/Sketch"				
	□F	section	n. ock with access to stream or intertidal zone				
	□G		sive algae in stream or intertidal zone				
	□H		ded marsh vegetation in the intertidal zone (removal, burning, regular mowing, destruction, etc)				
	∏ا ∐ا		: (explain in "Notes/Sketch" section) to no stressors				
8.	Rece	nt Weath	er – watershed metric (skip for Tidal Marsh Streams)				
-	For S	ize 1 or 2	streams, D1 drought or higher is considered a drought; for Size 3 or 4 streams, D2 drought or higher is considered a drought.				
	□A □B		ht conditions <u>and</u> no rainfall or rainfall not exceeding 1 inch within the last 48 hours ht conditions <u>and</u> rainfall exceeding 1 inch within the last 48 hours				
	⊠c		ought conditions				
9.	Large	e or Dang	erous Stream – assessment reach metric				
	□Ye	s 🛮 No	Is stream is too large or dangerous to assess? If Yes, skip to Metric 13 (Streamside Area Ground Surface Condition).				
10.			am Habitat Types – assessment reach metric				
	10a.	□Yes	No Degraded in-stream habitat over majority of the assessment reach (examples of stressors include excessive sedimentation, mining, excavation, in-stream hardening [for example, rip-rap], recent dredging, and snagging) (evaluate for Size 4 Coastal Plain streams only, then skip to Metric 12)				
	10b.		that occur (occurs if > 5% coverage of assessment reach) (skip for Size 4 Coastal Plain streams)				
		□A	Multiple aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats) Multiple sticks and/or leaf packs and/or emergent vegetation Multiple snags and logs (including lap trees) Multiple snags and logs (or root mats and/or roots Multiple snags and logs (including lap trees) Multiple snags and logs (including lap trees)				
		□В	Multiple sticks and/or leaf packs and/or emergent				
		□с	vegetation				
		□Ď					
		⊠E	in banks extend to the normal wetted perimeter Little or no habitat				
			Ettie of no nastat				
****	*****	******	**********REMAINING QUESTIONS ARE NOT APPLICABLE FOR TIDAL MARSH STREAMS************************************				
11.	Bedf	orm and	Substrate – assessment reach metric (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams)				
	11a.	⊠Yes	□No Is assessment reach in a natural sand-bed stream? (skip for Coastal Plain streams)				
	11b.		evaluated. Check the appropriate box(es). Riffle-run section (evaluate 11c)				
		⊠a ⊠b	Pool-glide section (evaluate 11d)				
		□с	Natural bedform absent (skip to Metric 12, Aquatic Life)				
	11c.	at least	ctions, check all that occur below the normal wetted perimeter of the assessment reach – whether or not submerged. Check the box in each row (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams). Not Present (NP) = absent, Rare sent but \leq 10%, Common (C) = > 10-40%, Abundant (A) = > 40-70%, Predominant (P) = > 70%. Cumulative percentages				
		should no	t exceed 100% for each assessment reach.				
		NP ⊠	R C A P □ □ □ Bedrock/saprolite				
			Boulder (256 – 4096 mm)				
		\boxtimes	□ □ □ □ Cobble (64 – 256 mm)				
		H	□ □ □ □ Gravel (2 – 64 mm) □ □ □ □ Sand (.062 – 2 mm)				
		\boxtimes	□ □ □ □ Sand (.062 – 2 mm) □ □ □ □ Silt/clay (< 0.062 mm)				
			Detritus Artificial (rip-rap, concrete, etc.)				
	11d	⊠Yes	□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □				
	u.		Feelo mod mar occurrent (only for one 4 october 1 tall of outling and frad march of outling)				

12.			sessment reach metric (skip for Tidal Marsh Streams)
	12a. ☐ If N		No Was an in-stream aquatic life assessment performed as described in the User Manual? one of the following reasons and skip to Metric 13. ☐No Water ☐Other:
	12b. □	Yes 🗵	No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.
	1		Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams. Adult frogs Aquatic reptiles
			Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats)
			Beetles Caddisfly larvae (T)
			Asian clam (<i>Corbicula</i>) Crustacean (isopod/amphipod/crayfish/shrimp)
	R		Damselfly and dragonfly larvae Dipterans
	Ē		Mayfly larvae (E) Megaloptera (alderfly, fishfly, dobsonfly larvae)
			Midges/mosquito larvae
			Mosquito fish (<i>Gambusia</i>) or mud minnows (<i>Umbra pygmaea)</i> Mussels/Clams (not <i>Corbicula</i>)
			Other fish Salamanders/tadpoles
	Ä		Snails
	Ë		Stonefly larvae (P) Tipulid larvae
12	_		Worms/leeches Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types)
13.	Conside	r for the	Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff.
	LB ⊠A	RB ⊠A	Little or no alteration to water storage capacity over a majority of the streamside area
	□B □C	□B □C	Moderate alteration to water storage capacity over a majority of the streamside area Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction, livestock disturbance, buildings, man-made levees, drainage pipes)
14.			Water Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Left Bank (LB) and the Right Bank (RB) of the streamside area.
	□A □B ⊠C	□A □B ⊠C	Majority of streamside area with depressions able to pond water ≥ 6 inches deep Majority of streamside area with depressions able to pond water 3 to 6 inches deep Majority of streamside area with depressions able to pond water < 3 inches deep
15.	Conside wetted pe	r for the erimeter	 e – streamside area metric (skip for Tidal Marsh Streams) Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the normal of assessment reach.
	LB □Y ⊠N	RB □Y ⊠N	Are wetlands present in the streamside area?
16.			outors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams)
	Check a ☐A		utors within the assessment reach or within view of <u>and</u> draining to the assessment reach. and/or springs (jurisdictional discharges)
	□B □C	Ponds (nclude wet detention basins; do not include sediment basins or dry detention basins) ion passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir)
	\Box D	Evidenc	e of bank seepage or sweating (iron in water indicates seepage)
	⊠E □F		ped or bank soil reduced (dig through deposited sediment if present) the above
17.	Baseflov Check a		ors – assessment area metric (skip for Tidal Marsh Streams)
	\square A	Evidenc	e of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation)
	□B □C	Urban s	ion not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit) ream (≥ 24% impervious surface for watershed)
	□D □E		e that the streamside area has been modified resulting in accelerated drainage into the assessment reach nent reach relocated to valley edge
4.5	⊠F	None of	the above
18.	_		sment reach metric (skip for Tidal Marsh Streams) Consider "leaf-on" condition.
	⊠a □B	Stream Degrade	shading is appropriate for stream category (may include gaps associated with natural processes) d (example: scattered trees)
	□С	Stream	shading is gone or largely absent

19.	Buffer Width – streamside area metric (skip for Tidal Marsh Streams) Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out to the first break. Vegetated Wooded LB RB LB RB $\triangle A \triangle A \triangle A \ge 100$ feet wide or extends to the edge of the watershed $\triangle B \triangle B \triangle B \triangle B \triangle B \triangle B$ From 50 to < 100 feet wide $\triangle C \triangle C \triangle C \triangle C \triangle B$ From 30 to < 50 feet wide $\triangle B \triangle B \triangle B \triangle B$ From 10 to < 30 feet wide $\triangle B \triangle B \triangle B$ From 10 to < 30 feet wide
20.	Buffer Structure – streamside area metric (skip for Tidal Marsh Streams) Consider for left bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width). LB RB A Mature forest B B Non-mature woody vegetation or modified vegetation structure C C Herbaceous vegetation with or without a strip of trees < 10 feet wide D D Maintained shrubs E E Little or no vegetation
21.	Buffer Stressors – streamside area metric (skip for Tidal Marsh Streams) Check all appropriate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is within 30 feet of stream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet). If none of the following stressors occurs on either bank, check here and skip to Metric 22: Abuts < 30 feet 30-50 feet LB RB LB RB A A A A A A A A A A A A A A A A A A A
22.	Stem Density – streamside area metric (skip for Tidal Marsh Streams) Consider for left bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width). LB RB A Medium to high stem density B B Low stem density C C No wooded riparian buffer or predominantly herbaceous species or bare ground
23.	Continuity of Vegetated Buffer – streamside area metric (skip for Tidal Marsh Streams) Consider whether vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide. LB RB A The total length of buffer breaks is < 25 percent. B B B The total length of buffer breaks is between 25 and 50 percent. C C The total length of buffer breaks is > 50 percent.
24.	Vegetative Composition – streamside area metric (skip for Tidal Marsh Streams) Evaluate the dominant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to assessment reach habitat. LB RB ☑A Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species, with non-native invasive species absent or sparse. □B □B Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or communities with non-native invasive species present, but not dominant, over a large portion of the expected strata or communities missing understory but retaining canopy trees. □C □C Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent or communities with non-native invasive species dominant over a large portion of expected strata or communities composed of planted stands of non-characteristic species or communities inappropriately composed of a single species or no vegetation.
25.	Conductivity – assessment reach metric (skip for all Coastal Plain streams) 25a. ☐ Yes ☐ No Was conductivity measurement recorded? If No, select one of the following reasons. ☐ No Water ☐ Other: 25b. Check the box corresponding to the conductivity measurement (units of microsiemens per centimeter). ☐ A < 46 ☐ B 46 to < 67 ☐ C 67 to < 79 ☐ D 79 to < 230 ☐ E ≥ 230
Niedi	on/Sketah:

Intermittent channel within forested crenulation draining to Falling Creek. Shallow channel with inconsistant bed and bank. Ordinary high water mark present.

Stream Site Name	U-5706, Stream SA	Date of Assessmer	nt 7/12/2018	
Stream Category	la2	Assessor Name/Organization		riom
5 ,		<u>.</u>		
Notes of Field Asses	ssment Form (Y/N)		YES	
Presence of regulate	ory considerations (Y/N)		NO	
Additional stream in	formation/supplementary measu	rements included (Y/N)	YES	
NC SAM feature typ	e (perennial, intermittent, Tidal I	Marsh Stream)	Perennia	
	Formation Olaca Bation Comm		USACE/	NCDWR
	Function Class Rating Sumr	nary	All Streams	Intermittent
	(1) Hydrology		LOW	
	(2) Baseflow		LOW	
	(2) Flood Flow	<u> </u>	LOW	
	(3) Streamside A	_	LOW	
	(4) Floodpl		LOW	
	` '	d Riparian Buffer	LOW	
	(4) Microto	· • · · —	LOW	
	(3) Stream Stabili	ty	LOW	
	(4) Channe	el Stability	LOW	
	(4) Sedime	nt Transport	HIGH	
	(4) Stream	Geomorphology	LOW	
	(2) Stream/Intertion	dal Zone Interaction	NA	NA
	(2) Longitudinal Tid	dal Flow	NA	NA
	(2) Tidal Marsh Str	ream Stability	NA	NA
	(3) Tidal Ma	arsh Channel Stability	NA	NA
	(3) Tidal Ma	arsh Stream Geomorphology	NA	NA
	(1) Water Quality		LOW	
	(2) Baseflow		LOW	
	(2) Streamside Area Ve	getation	MEDIUM	_
	(3) Upland Polluta	·	MEDIUM	
	(3) Thermoregula		MEDIUM	
	(2) Indicators of Stresso		YES	
	(2) Aquatic Life Toleran		LOW	
	(2) Intertidal Zone Filtration		NA	NA
	(1) Habitat	-	LOW	
	(2) In-stream Habitat		LOW	_
	(3) Baseflow		LOW	
	(3) Substrate		HIGH	
	(3) Stream Stabili	tv.	LOW	
	(3) In-stream Hab	· —	LOW	
	(2) Stream-side Habitat		LOW	
	` '			
	(3) Stream-side H		LOW	
	(3) Thermoregula		LOW	NIA
	(2) Tidal Marsh In-stream		NA NA	NA NA
	(3) Flow Restriction	_	NA	NA NA
	(3) Tidal Marsh Str		NA	NA
		arsh Channel Stability	NA	NA
		arsh Stream Geomorphology	NA	NA
	(3) Tidal Marsh In-	stream Habitat	NA	NA
	(2) Intertidal Zone		NΙΛ	NΙΛ

Overall

LOW

		ACC	ompanies oser	vialiuai veisioli 2. i		
USACE A	JD #:			NCDWR #:		
INSTRUC	TIONS: Attach a s	ketch of the assessment	area and photogr	aphs. Attach a copy of the	USGS	7.5-minute topographic quadrangle,
and circle	the location of the	stream reach under eval	uation. If multiple	e stream reaches will be e	valuated	on the same property, identify and
number al	I reaches on the att	ached map, and include a	a separate form fo	or each reach. See the NO	SAM U	ser Manual for detailed descriptions
and explai	nations of requeste	ed information. Record in	the "Notes/Sketo	ch" section if supplementa	ry measi	urements were performed. See the
		amples of additional meas				
NOTE EV	IDENCE OF STRE	SSORS AFFECTING TH	IE ASSESSMENT	TAREA (do not need to I	oe withii	n the assessment area).
PROJEC1	SITE INFORMAT	ION:				
1. Project	name (if any):	U-5706- Stream SE		2. Date of evaluation:	7/12/20	18
3. Applica	nt/owner name:	NCDOT		4. Assessor name/organi	zation:	A.Keith/Axiom
5. County:		Rockingham		6. Nearest named water	body	
7. River ba		Yadkin-PeeDee		on USGS 7.5-minute	quad:	Falling Creek
8. Site cod	ordinates (decimal o	degrees, at lower end of a	assessment reach	n): 34.939022, -79.725	5261	
STREAM	INFORMATION: (d	depth and width can be	approximations)		
9. Site nur	mber (show on atta	ched map): Stream S	SE 10.	Length of assessment rea	ch evalu	ated (feet): 50
11. Chann	el depth from bed ((in riffle, if present) to top	of bank (feet):	1-3		Inable to assess channel depth.
	nel width at top of ba			assessment reach a swan	np steam	i? □Yes ⊠No
		al flow Intermittent flow	w □Tidal Marsh	Stream		
	CATEGORY INFO		_	_		_
15. NC SA	NM Zone:	☐ Mountains (M)	☐ Piedmont (F	P) 🛛 Inner Coastal Pl	ain (I)	☐ Outer Coastal Plain (O)
				1		/
				\		
16. Estima	ated geomorphic			/		
	shape (skip for	⊠A <u> </u>	\cup	□В		
Tidal I	Marsh Stream):	(more sinuous stream	m, flatter valley sl	ope) (less si	nuous st	ream, steeper valley slope)
17. Waters	shed size: (skip	\boxtimes Size 1 (< 0.1 mi ²)	☐Size 2 (0.1	to $< 0.5 \text{ mi}^2$) \square Size 3	(0.5 to <	5 mi²)
	dal Marsh Stream)					
	NAL INFORMATIO					
				neck all that apply to the a		
	tion 10 water	☐Classified T			-	shed (I III IIV IV)
	ential Fish Habitat	□Primary Nui	•	•	•	s/Outstanding Resource Waters
	olicly owned propert		parian buffer rule			
_	adromous fish	□303(d) List	liated protected a	pecies within the assessn		ronmental Concern (AEC)
	t species:	on a rederal and/or state	iistea protectea s	species within the assessin	ieni area	1.
	signated Critical Ha	hitat (list species)				
			measurements inc	cluded in "Notes/Sketch" s	ection or	attached2 MVes IINo
15.7110 00	ditional stream inte	mation/supplementary in	neasurements in	radea III 140tes/Oketeri 3	cction of	attached: MTC3 LIVE
1. Chann	iel Water – assess	ment reach metric (skir	o for Size 1 strea	ms and Tidal Marsh Stre	eams)	
		ut assessment reach.			,	
⊟в	No flow, water ir					
□с	No water in asse	essment reach.				
2. Evider	nce of Flow Restri	ction - assessment rea	ch metric			
				fle-pool sequence is seve	relv affe	cted by a flow restriction or fill to the
						impoundment on flood or ebb within
						the channel, tidal gates, debris jams,
□ -	beaver dams).					
⊠B	Not A					
3. Featur	e Pattern – asses	sment reach metric				
\boxtimes A	A majority of the	assessment reach has a	altered pattern (ex	camples: straightening, mo	dification	n above or below culvert).
□в	Not A					
4. Featur	e Longitudinal Pr	ofile – assessment reac	ch metric			
✓A. I Catal	_			tream profile (examples: (channel o	down-cutting, existing damming, over
, v						has not reformed from any of these
	disturbances).	55		11 -1		
□В	Not A					
5. Sians	of Active Instabili	ty – assessment reach	metric			
_		=		the stream has currently	/ recove	ered. Examples of instability include
						uch as concrete, gabion, rip-rap).
⊠A	< 10% of channe	el unstable	,.	<u>.</u>	5 (-	7 7 1 17
□в	10 to 25% of cha					
ПС	> 25% of channe	el unstable				

ь.				raction – Bank (LB							
	LB	RB	ine Leit	Dalik (LD) and the	Kigiii ba	IIK (KD).				
	□A ⊠B	□A ⊠B	Mod refe or in	derate evi erence inte ntermitten	dence of c raction (ex t bulkhead	conditions xamples: ls, causev	limited stream ways with floor	perms, levenside area a aplain cons	ees, down access, distriction, m	-cutting, aggradation, dredging) that adversely sruption of flood flows through streamside area, ninor ditching [including mosquito ditching])	leaky
	□C	□c	[exa of fl mos	amples: ca	auseways through st hing]) <u>or</u> f	with flood reamside	lplain and cha area] <u>or</u> too m	nnel constr uch floodp	iction, bull lain/interti	teraction (little to no floodplain/intertidal zone ackheads, retaining walls, fill, stream incision, disrudal zone access [examples: impoundments, inteor assessment reach is a man-made feature of	uption ensive
7.	Wate	r Quality	Stresso	ors – asse	essment r	each/inte	ertidal zone m	etric			
	Check all that apply. □ A Discolored water in stream or intertidal zone (milky white, blue, unnatural water discoloration, oil sheen, stream foam) □ B Excessive sedimentation (burying of stream features or intertidal zone) □ C Noticeable evidence of pollutant discharges entering the assessment reach and causing a water quality problem □ D Odor (not including natural sulfide odors) □ E Current published or collected data indicating degraded water quality in the assessment reach. Cite source in "Notes/Sketch"							ketch"			
	□F □G □H □I	Exce Degr Othe	tock with ssive alo aded ma		am or inte ation in th	ertidal zon e intertida	е			nowing, destruction, etc)	
•					(.) . (.) .		-1.841.04				
8.		ize 1 or 2 Drou Drou	streams ght cond ght cond	s, D1 droughtions	ght or high I no rainfal	ner is cons II or rainfa	al Marsh Stre sidered a drou all not exceedi 1 inch within th	ght; for Siz ng 1 inch w	ithin the la	reams, D2 drought or higher is considered a dro ast 48 hours	ought.
9.	Larg e	_ •	-	Stream – a tream is to				If Yes, sk	ip to Metri	c 13 (Streamside Area Ground Surface Condition	on).
10.		ral In-stre ☐Yes	eam Hal ⊠No				each metric	ity of the	accacema	ent reach (examples of stressors include exce	avisa
	ioa.	□163		sedime	ntation, m	ining, exc	cavation, in-st	ream hard	lening [for	r example, rip-rap], recent dredging, and snag to Metric 12)	
	10b.	Check a ⊠A ⊠B	Multiple (include	e aquatic r e liverwort	nacrophyt s, lichens,	es and ac and alga	quatic mosses	Tidal	□F □G	Size 4 Coastal Plain streams) 5% oysters or other natural hard bottoms Submerged aquatic vegetation Low-tide refugia (pools)	
			vegetat	tion			_	ck for should be		Sand bottom	
		□C □D	5% und		ks and/or	root mats	s and/or roots	Che	□K	5% vertical bank along the marsh Little or no habitat	
		□E		s extend t no habita		nal wetted	d perimeter				
****	*****	******	******	**REMAIN	IING QUE	STIONS	ARE NOT AP	PLICABLE	FOR TID	OAL MARSH STREAMS************************************	**
11.	Bedf	orm and	Substra	ite – asse	ssment re	each met	ric (skip for S	ize 4 Coa	stal Plain	streams and Tidal Marsh Streams)	
	11a.	⊠Yes	□No	Is assess	sment rea	ch in a na	tural sand-be	d stream?	(skip for (Coastal Plain streams)	
	11b.	Bedform ⊠A ⊠B □C	Riffle-ru Pool-gl	ed. Chec un section ide section bedform	(evaluate	e 11c) e 11d)	box(es). tric 12, Aquat	ic Life)			
	11c.	at least (R) = pre	one box esent bu	in each r	ow (skip Common (for Size 4 (C) = > 10	4 Coastal Plai 0-40%, Abund	n streams	and Tida	sessment reach – whether or not submerged. $\bf C$ il $\bf Marsh \ Streams)$. Not Present (NP) = absent, Predominant (P) = > 70%. Cumulative percent	Rare
		NP	R	C	A 🔲	P	Bedrock/sap Boulder (25		nm)		
			Ä		Ä	Ħ	Cobble (64 Gravel (2 –	– 256 mm)			
		Ħ	Ä			Ħ	Sand (.062	– 2 mm)			
							Silt/clay (< 0 Detritus				
	114	⊠ □Yes	∐ ⊠No	Are pool		∐ h sedimer	Artificial (rip	• •	,	streams and Tidal Marsh Streams)	
	i iu.	03	∠ 3. 4 0	, are pool.	S AMOU WILL	Journal	(Simp 101 C	 	osai i iaili	on James and Trade margin Ottoding	

12.	-		sessment reach metric (skip for Tidal Marsh Streams)
	12a. ⊠ If N		No Was an in-stream aquatic life assessment performed as described in the User Manual? one of the following reasons and skip to Metric 13. ☐No Water ☐Other:
	12b. 🛚	Yes	No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.
	1 ⊠ □		Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams. Adult frogs Aquatic reptiles
			Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats) Beetles
			Caddisfly larvae (T) Asian clam (<i>Corbicula</i>)
			Crustacean (isopod/amphipod/crayfish/shrimp) Damselfly and dragonfly larvae
			Dipterans Mayfly larvae (E) Magaloptora (alderfly, fightly, debsorfly larvae)
			Megaloptera (alderfly, fishfly, dobsonfly larvae) Midges/mosquito larvae Mosquito fish (<i>Gambusia</i>) or mud minnows (<i>Umbra pygmaea</i>)
			Mussels/Clams (not <i>Corbicula</i>) Other fish
			Salamanders/tadpoles Snails
			Stonefly larvae (P) Tipulid larvae
13.	_	_	Worms/leeches Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types)
			Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff.
	□A ⊠B	□a ⊠B	Little or no alteration to water storage capacity over a majority of the streamside area Moderate alteration to water storage capacity over a majority of the streamside area
	С	С	Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction, livestock disturbance, buildings, man-made levees, drainage pipes)
14.			Water Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Left Bank (LB) and the Right Bank (RB) of the streamside area.
	□A ⊠B □C	□A ⊠B □C	Majority of streamside area with depressions able to pond water ≥ 6 inches deep Majority of streamside area with depressions able to pond water 3 to 6 inches deep Majority of streamside area with depressions able to pond water < 3 inches deep
15.	Conside wetted p	r for the	 e – streamside area metric (skip for Tidal Marsh Streams) Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the normal of assessment reach.
	⊠Y □N	⊠Y □N	Are wetlands present in the streamside area?
16.			outors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams) utors within the assessment reach or within view of <u>and</u> draining to the assessment reach.
	□A □B	Streams	and/or springs (jurisdictional discharges) nclude wet detention basins; do not include sediment basins or dry detention basins)
	□c □d	Obstruc	ion passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir) e of bank seepage or sweating (iron in water indicates seepage)
	⊠E □F		ped or bank soil reduced (dig through deposited sediment if present) the above
17.	Baseflov Check a		ors – assessment area metric (skip for Tidal Marsh Streams) ply.
	□A □B	Obstruc	e of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation) ion not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit)
	⊠C □D □E	Evidenc	ream (≥ 24% impervious surface for watershed) e that the streamside area has been modified resulting in accelerated drainage into the assessment reach
	□F	None of	nent reach relocated to valley edge the above
18.	Consider	aspect.	sment reach metric (skip for Tidal Marsh Streams) Consider "leaf-on" condition.
	□A □B ⊠C	Degrade	shading is appropriate for stream category (may include gaps associated with natural processes) d (example: scattered trees) shading is gone or largely absent
		J Juil 1	

19.	Buffer Width – streamside area metric (skip for Tidal Marsh Streams) Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out to the first break.						
	Vegetated Wooded LB RB LB RB ☑A ☑A ☐A ≥ 100 feet wide or extends to the edge of the watershed ☐B ☐B ☐B ☐B From 50 to < 100 feet wide ☐C ☐C ☐C From 30 to < 50 feet wide ☐D ☐D ☐D From 10 to < 30 feet wide ☐E ☐E ☐E ☐E ✓E < 10 feet wide or no trees						
20.	Buffer Structure – streamside area metric (skip for Tidal Marsh Streams) Consider for left bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width).						
	LB RB A Mature forest						
	□B Non-mature woody vegetation or modified vegetation structure □C □C Herbaceous vegetation with or without a strip of trees < 10 feet wide						
	D D Maintained shrubs Little or no vegetation						
21.	Buffer Stressors – streamside area metric (skip for Tidal Marsh Streams) Check all appropriate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is within 30 feet of stream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet). If none of the following stressors occurs on either bank, check here and skip to Metric 22:						
	Abuts < 30 feet 30-50 feet LB RB LB RB LB RB						
	□A □A □A □A □A Row crops □B □B □B □B □B Maintained turf						
	□C □C □C □C Pasture (no livestock)/commercial horticulture □D □D						
22.	Stem Density – streamside area metric (skip for Tidal Marsh Streams) Consider for left bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width). LB RB						
	□A □A Medium to high stem density □B □B Low stem density						
	☑C ☑C No wooded riparian buffer or predominantly herbaceous species or bare ground						
23.	Continuity of Vegetated Buffer – streamside area metric (skip for Tidal Marsh Streams) Consider whether vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide. LB RB						
	 ☑A ☑A The total length of buffer breaks is < 25 percent. □B □B The total length of buffer breaks is between 25 and 50 percent. □C □C The total length of buffer breaks is > 50 percent. 						
24.	Vegetative Composition – streamside area metric (skip for Tidal Marsh Streams) Evaluate the dominant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to assessment reach habitat.						
	LB RB ☐A Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species,						
	with non-native invasive species absent or sparse. Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or communities with non-native invasive species present, but not dominant, over a large portion of the expected strata						
	communities missing understory but retaining canopy trees. Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent <u>or</u> communities with non-native invasive species dominant over a large portion of expected strata <u>or</u> communities composed of planted stands of non-characteristic species <u>or</u> communities inappropriately composed of a single species <u>or</u> no vegetation.						
25.	Conductivity – assessment reach metric (skip for all Coastal Plain streams) 25a. ☐ Yes ☐ No Was conductivity measurement recorded? If No, select one of the following reasons. ☐ No Water ☐ Other:						
	25b. Check the box corresponding to the conductivity measurement (units of microsiemens per centimeter). $\Box A < 46 \qquad \Box B 46 \text{ to } < 67 \qquad \Box C 67 \text{ to } < 79 \qquad \Box D 79 \text{ to } < 230 \qquad \Box E \geq 230$						
	es/Sketch:						
Stre	am flows from forest into a maintained clear-cut powerline easement. No wooded buffer or canopy present.						

Stream Site Name	U-5706- Stream SE	Date of Assessment	7/12/2018	
Stream Category	la1	Assessor Name/Organization	A.Keith/Axiom	
Notes of Field Asses	ssment Form (Y/N)		YES	
Presence of regulato	ory considerations (Y/N)		NO	
Additional stream inf	formation/supplementary measu	rements included (Y/N)	YES	
NC SAM feature type	e (perennial, intermittent, Tidal N	Marsh Stream)	Perennial	

u · · · · · · · · · · · · · · · · · · ·		
	USACE/	NCDWR
Function Class Rating Summary	All Streams	Intermittent
(1) Hydrology	LOW	
(2) Baseflow	MEDIUM	
(2) Flood Flow	LOW	
(3) Streamside Area Attenuation	LOW	
(4) Floodplain Access	MEDIUM	
(4) Wooded Riparian Buffer	LOW	
(4) Microtopography	MEDIUM	
(3) Stream Stability	MEDIUM	
(4) Channel Stability	HIGH	
(4) Sediment Transport	HIGH	
(4) Stream Geomorphology	LOW	
(2) Stream/Intertidal Zone Interaction	NA	
(2) Longitudinal Tidal Flow	NA	
(2) Tidal Marsh Stream Stability	NA	
(3) Tidal Marsh Channel Stability	NA	
(3) Tidal Marsh Stream Geomorphology	NA	
(1) Water Quality	LOW	
(2) Baseflow	MEDIUM	
(2) Streamside Area Vegetation	MEDIUM	
(3) Upland Pollutant Filtration	HIGH	
(3) Thermoregulation	LOW	
(2) Indicators of Stressors	NO	
(2) Aquatic Life Tolerance	LOW	
(2) Intertidal Zone Filtration	NA NA	
(1) Habitat	LOW	
(2) In-stream Habitat	LOW	
(3) Baseflow	MEDIUM	
(3) Substrate	LOW	
(3) Stream Stability	MEDIUM	
(3) In-stream Habitat	MEDIUM	
(2) Stream-side Habitat	LOW	
(3) Stream-side Habitat	LOW	
(3) Thermoregulation	LOW	
(3) Mermoregulation (2) Tidal Marsh In-stream Habitat	NA NA	
. ,	NA NA	
(3) Flow Restriction		
(3) Tidal Marsh Stream Stability (4) Tidal Marsh Channel Stability	NA NA	
* *	NA NA	
(4) Tidal Marsh Stream Geomorphology	NA NA	
(3) Tidal Marsh In-stream Habitat	NA NA	
(2) Intertidal Zone	NA NA	
Overall	LOW	

	7,000,111		
USACE AID #:		NCDWR #:	
			USGS 7.5-minute topographic quadrangle,
			aluated on the same property, identify and
			SAM User Manual for detailed descriptions
			measurements were performed. See the
	examples of additional measure		
NOTE EVIDENCE OF STI	RESSORS AFFECTING THE A	SSESSMENT AREA (do not need to be	e within the assessment area).
PROJECT/SITE INFORM	ATION:		
1. Project name (if any):	U-5706 Stream SG	Date of evaluation:	190110
3. Applicant/owner name:	NCDOT	4. Assessor name/organiz	ation: A.Keith/Axiom
5. County:	Rockingham	6. Nearest named water b	ody
7. River basin:	Yadkin-PeeDee	on USGS 7.5-minute q	
8. Site coordinates (decim	al degrees, at lower end of asse	essment reach): 34.964274, -79.7383	322
·	(depth and width can be app		
9. Site number (show on a		10. Length of assessment reac	h evaluated (feet): 50
	d (in riffle, if present) to top of I		Unable to assess channel depth.
12. Channel width at top o		13. Is assessment reach a swamp	· _
	nial flow Intermittent flow		
STREAM CATEGORY IN			
15. NC SAM Zone:		☐ Piedmont (P) ☐ Inner Coastal Pla	in (I) Uniter Coastal Plain (O)
3			,
		\	
	1	,	
16. Estimated geomorphic	\Box A \frown		
valley shape (skip for Tidal Marsh Stream):	(more sinuous stream, f		ious stroom, stooper valley slope)
ŕ			uous stream, steeper valley slope)
17. Watershed size: (skip	· · · · · · · · · · · · · · · · · · ·	\square Size 2 (0.1 to < 0.5 mi ²) \square Size 3 (0	0.5 to < 5 mi²) □Size 4 (≥ 5 mi²)
for Tidal Marsh Strea	,		
ADDITIONAL INFORMAT		The Mark that all the control of the control	
		No If Yes, check all that apply to the as	
Section 10 water	Classified Trou	- ···	y Watershed (☐I ☐II ☐III ☐IV ☐V)
Essential Fish Habit	_ ,		Waters/Outstanding Resource Waters
Publicly owned prop		an buffer rule in effect Nutrient Sens	
☐ Anadromous fish	□303(d) List	ed protected species within the assessme	of Environmental Concern (AEC)
List species:	ce of a rederal and/or state list	ed protected species within the assessing	ent area.
Designated Critical	Habitat (list species)		
		surements included in "Notes/Sketch" se	ction or attached? ⊠Yes □No
19. Are additional stream	mormation/supplementary mea	surements included in Notes/Sketch se	Clion of attached? A res Lino
1. Channel Water – asse	sement reach metric (skin fo	r Size 1 streams and Tidal Marsh Strea	ame)
	nout assessment reach.	Olze i stredilis and ridai Maish Stree	anis)
	r in pools only.		
	ssessment reach.		
_			
	triction – assessment reach		alica de la descripción de la constantia de
			ely affected by a flow restriction or fill to the
politi oi odsti tha accacema	ucting now <u>or</u> a channer choke ent reach (examples: undersize	u wiiii aqualic macrophytes <u>or</u> ponded w od or perched culverts, causeways that co	rater or impoundment on flood or ebb within onstrict the channel, tidal gates, debris jams,
beaver dams		d of perched curverts, causeways that of	onstrict the charmer, tidal gates, debits jams,
⊠B Not A	•		
	and the second s		
	essment reach metric	ad nottono (overnolo-s-to-i-l-ti-s-	lification above or helevy subsective
	ne assessment reach has alter	ed pattern (examples: straightening, mod	diffication above or below culvert).
☐B Not A			
4. Feature Longitudinal	Profile – assessment reach n	netric	
☑A Majority of as	sessment reach has a substant	ially altered stream profile (examples: ch	nannel down-cutting, existing damming, over
widening, act	ive aggradation, dredging, and	excavation where appropriate channel	profile has not reformed from any of these
disturbances)			
☐B Not A			
5. Signs of Active Instal	ility – assessment reach met	ric	
_	=		recovered. Examples of instability include
		-cut), active widening, and artificial harde	
	nnel unstable		
	channel unstable		
□C > 25% of cha	nnel unstable		

6.					streamsic					
	Cons LB	ider for t RB	he Left	Bank (LE	B) and the	Right Ba	ink (RB).			
	□A ⊠B	∏A ⊠B	Mo refe	derate evi erence inte	idence of o eraction (ex	conditions xamples:	limited streamsi	rms, leve de area a	es, down- ccess, dis	eraction cutting, aggradation, dredging) that adversely affect ruption of flood flows through streamside area, leaky nor ditching [including mosquito ditching])
	□C	□c	Ext [ex of f mo	tensive ev amples: c lood flows	vidence of o causeways s through st ching]) <u>or</u> f	conditions with flood reamside	s that adversely a dplain and chann a area] <u>or</u> too mud	affect refe el constri ch floodpla	erence inte ction, bulk ain/intertic	peraction (little to no floodplain/intertidal zone access heads, retaining walls, fill, stream incision, disruption lal zone access [examples: impoundments, intensive or assessment reach is a man-made feature on an
7.	Wate	r Qualitv	Stress	ors – ass	essment r	each/inte	ertidal zone met	tric		
	Chec	k all that	apply.							
	□A □B						ne (milky white, t m features or int			er discoloration, oil sheen, stream foam)
										nd causing a water quality problem
	\Box D	Odor	(not inc	cluding nat	tural sulfide	e odors)	_			
	□E	Curre		ished or c	collected d	ata indica	ating degraded v	water qua	ility in the	assessment reach. Cite source in "Notes/Sketch"
	□F			th access	to stream o	or intertida	al zone			
	□G □H				eam or inte			burning	rogular m	nowing, destruction, etc)
	⊠ı			_	tation in th		n in "Notes/Sketc			owing, destruction, etc)
	□J	Little	to no st	tressors						
8.							lal Marsh Stream		. 0 4	DO d
		Drou	ght cond	s, Di diou ditions and	d no rainfa	ll or rainfa	all not exceeding	1 inch wi	thin the la	eams, D2 drought or higher is considered a drought. st 48 hours
	□В	Drou	ght cond	ditions <u>and</u>			1 inch within the			
_	⊠c		_	conditions						
9.	∐Ye	•	•		assessme too large or			Yes, skip	to Metric	13 (Streamside Area Ground Surface Condition).
10.							each metric	of the o		at reach (examples of atreasers include examples
	10a.	□Yes	⊠No	sedime	entation, m	iining, ex		am harde	ening [for	nt reach (examples of stressors include excessive example, rip-rap], recent dredging, and snagging) to Metric 12)
	10b.									ize 4 Coastal Plain streams)
		□A			ts, lichens,		quatic mosses al mats)	Check for Tidal Marsh Streams Only	□F □G	5% oysters or other natural hard bottoms Submerged aquatic vegetation
		⊠в	Multipl	e sticks a			d/or emergent	k for T h Stre Only	□H H	Low-tide refugia (pools)
		□с	vegeta Multipl		ınd logs (in	cluding la	ip trees)	heck arsh	□J □I	Sand bottom 5% vertical bank along the marsh
		□D	5% un	dercut bar	nks and/or	root mat	s and/or roots	סֿ≥	□K	Little or no habitat
		□E		ks extend r no habita		nai wetted	d perimeter			
****	******	******	******	**REMAIN	NING QUE	STIONS	ARE NOT APPL	LICABLE	FOR TID	AL MARSH STREAMS************************************
11.	Bedfe	orm and	Substra	ate – asse	ssment re	each met	ric (skip for Siz	e 4 Coas	tal Plain	streams and Tidal Marsh Streams)
		⊠Yes	□No					stream? (s	skip for C	oastal Plain streams)
	11b.	Bedform ⊠A			ck the app		box(es).			
		⊠B	Pool-g	lide sectio	on (evaluat	e 11d)				
		□с			•	•	tric 12, Aquatic	•		
	11c.	at least	one box	k in each	row (skip	for Size 4	4 Coastal Plain	streams	and Tidal	essment reach – whether or not submerged. Check Marsh Streams) . Not Present (NP) = absent, Rare Predominant (P) = > 70%. Cumulative percentages
		should n	ot_exce	ed 100% f	or each as	sessmen		,		, ,
		NP ⊠	R □	C	A	P	Bedrock/sapro	olite		
		\boxtimes					Boulder (256 -	– 4096 mi	m)	
		\boxtimes	H	님		H	Cobble (64 – 2 Gravel (2 – 64			
				ij			Sand (.062 – 2	2 mm)		
			R				Silt/clay (< 0.0 Detritus)62 mm)		
					\square		Artificial (rip-ra	ap, concre	ete, etc.)	
	11d.	⊠Yes	□No	Are poo	Is filled wit	h sedimei	nt? (skip for Siz	e 4 Coas	tal Plain	streams and Tidal Marsh Streams)

12.	-		sessment reach metric (skip for Tidal Marsh Streams)
	12a. ⊠ If N		No Was an in-stream aquatic life assessment performed as described in the User Manual? one of the following reasons and skip to Metric 13. ☐No Water ☐Other:
	12b. 🗌	Yes 🗵	No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.
	1		Adult frogs
			Aquatic reptiles Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats)
			Beetles Caddisfly larvae (T)
	Ä		Asian clam (Corbicula)
			Crustacean (isopod/amphipod/crayfish/shrimp) Damselfly and dragonfly larvae
			Dipterans Mayfly larvae (E)
	Ĕ		Megaloptera (alderfly, fishfly, dobsonfly larvae)
			Midges/mosquito larvae Mosquito fish (<i>Gambusia</i>) or mud minnows (<i>Umbra pygmaea</i>)
			Mussels/Clams (not Corbicula)
			Other fish Salamanders/tadpoles
			Snails Stonefly larvae (P)
	Ë		Tipulid larvae Worms/leeches
13.	Streams	ide Area	Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types)
	LB	RB	Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff.
	⊠a ⊟B	⊠a □B	Little or no alteration to water storage capacity over a majority of the streamside area Moderate alteration to water storage capacity over a majority of the streamside area
	□c	□c	Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction, livestock disturbance, buildings, man-made levees, drainage pipes)
14.			Water Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Left Bank (LB) and the Right Bank (RB) of the streamside area.
	□A ⊠B □C	□A ⊠B □C	Majority of streamside area with depressions able to pond water ≥ 6 inches deep Majority of streamside area with depressions able to pond water 3 to 6 inches deep Majority of streamside area with depressions able to pond water < 3 inches deep
15.	Conside wetted p	er for the erimeter	e – streamside area metric (skip for Tidal Marsh Streams) Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the normal of assessment reach.
	LB ⊠Y ∏N	RB ⊠Y ∏N	Are wetlands present in the streamside area?
16.	Baseflo	w Contril	outors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams)
	Check a ☐A		outors within the assessment reach or within view of <u>and</u> draining to the assessment reach. and/or springs (jurisdictional discharges)
	□В	Ponds (i	nclude wet detention basins; do not include sediment basins or dry detention basins)
	□C 図D		ion passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir) e of bank seepage or sweating (iron in water indicates seepage)
	⊠E □F	Stream	ped or bank soil reduced (dig through deposited sediment if present) the above
17.		w Detrac	ors – assessment area metric (skip for Tidal Marsh Streams)
	\square A	Evidenc	e of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation)
	□в ⊠c		ion not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit) ream (≥ 24% impervious surface for watershed)
	□D □E	Evidenc	e that the streamside area has been modified resulting in accelerated drainage into the assessment reach
	□F		nent reach relocated to valley edge the above
18.			sment reach metric (skip for Tidal Marsh Streams)
	$\boxtimes A$	Stream	Consider "leaf-on" condition. shading is appropriate for stream category (may include gaps associated with natural processes)
	□B □C		d (example: scattered trees) shading is gone or largely absent

19.	Buffer Width – streamside area metric (skip for Tidal Marsh Streams) Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out to the first break.
	Vegetated Wooded LB RB LB RB \square A \square A \square A \supseteq 100 feet wide or extends to the edge of the watershed \square B \square B \square B From 50 to < 100 feet wide
20.	Buffer Structure – streamside area metric (skip for Tidal Marsh Streams) Consider for left bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width).
	LB RB □ A □ A Mature forest □ B □ B Non-mature woody vegetation or modified vegetation structure □ C □ C Herbaceous vegetation with or without a strip of trees < 10 feet wide □ D □ D Maintained shrubs □ E □ E Little or no vegetation
21.	Buffer Stressors – streamside area metric (skip for Tidal Marsh Streams) Check all appropriate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is within 30 feet of stream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet). If none of the following stressors occurs on either bank, check here and skip to Metric 22: Abuts < 30 feet 30-50 feet LB RB LB RB LB RB LB RB LB RB LB RB LB RB LB RB RB
	□A □A □A □A Row crops □B □B □B □B Maintained turf □C □C □C □C □C Pasture (no livestock)/commercial horticulture □D □D □D □D □D □D Pasture (active livestock use)
22.	Stem Density – streamside area metric (skip for Tidal Marsh Streams) Consider for left bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width).
	LB RB A Medium to high stem density
	 □B □B Low stem density □C □C No wooded riparian buffer or predominantly herbaceous species or bare ground
23.	Continuity of Vegetated Buffer – streamside area metric (skip for Tidal Marsh Streams) Consider whether vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide. LB RB
	 ☑A ☑B ☐B ☐C ☐C ☐C ☐C ☐D ☐D
24.	Vegetative Composition – streamside area metric (skip for Tidal Marsh Streams) Evaluate the dominant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to assessment reach habitat. LB RB
	□A Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species, with non-native invasive species absent or sparse.
	communities missing understory but retaining canopy trees. Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent or communities with non-native invasive species dominant over a large portion of expected strata or communities composed of planted stands of non-characteristic species or communities inappropriately composed of a single species or no vegetation.
25.	Conductivity – assessment reach metric (skip for all Coastal Plain streams) 25a. ☐ Yes ☐ No Was conductivity measurement recorded? If No, select one of the following reasons. ☐ No Water ☐ Other:
	25b. Check the box corresponding to the conductivity measurement (units of microsiemens per centimeter). $\Box A < 46$ $\Box B = 46$ to < 67 $\Box C = 67$ to < 79 $\Box D = 79$ to < 230 $\Box E = 230$

Intermittent stream originating at culvert(21.5 on SWIT form). Top of stream appears to be excavated. Low energy, abundant iron oxidizing bacteria and detritus making little habitat for benthics. Stream stream flows into wetland.

Stream Site Name	U-5706 Stream SG Date of Asses	ssment	190110	
Stream Category	lb1 Assessor Name/Organ			riom
Julianii Jaiogory			7	
Notes of Field Asses	ssment Form (Y/N)		YES	
	ory considerations (Y/N)		NO	
_	formation/supplementary measurements included (Y/N)		YES	
	e (perennial, intermittent, Tidal Marsh Stream)		Intermitter	 nt
ito o, iii roataro typ	o (poroninal, intermitterit, material officially		- IIICOIIIIICOI	<u></u>
			USACE/	NCDWR
	Function Class Rating Summary	Α	II Streams	Intermittent
	(1) Hydrology		LOW	LOW
	(2) Baseflow		MEDIUM	MEDIUM
	(2) Flood Flow		LOW	LOW
	(3) Streamside Area Attenuation		MEDIUM	MEDIUM
	(4) Floodplain Access		MEDIUM	MEDIUM
	(4) Wooded Riparian Buffer		HIGH	HIGH
	(4) Microtopography		NA NA	NA NA
	(3) Stream Stability		LOW	LOW
	(4) Channel Stability		HIGH	HIGH
	(4) Sediment Transport		LOW	LOW
	(4) Stream Geomorphology		LOW	LOW
	(2) Stream/Intertidal Zone Interaction		NA	NA
	(2) Longitudinal Tidal Flow		NA	NA
	(2) Tidal Marsh Stream Stability		NA	NA
	(3) Tidal Marsh Channel Stability		NA	NA
	(3) Tidal Marsh Stream Geomorpholog	ду	NA	NA
	(1) Water Quality		MEDIUM	MEDIUM
	(2) Baseflow		MEDIUM	MEDIUM
	(2) Streamside Area Vegetation		HIGH	HIGH
	(3) Upland Pollutant Filtration		HIGH	HIGH
	(3) Thermoregulation		HIGH	HIGH
	(2) Indicators of Stressors		NO	NO
	(2) Aquatic Life Tolerance		LOW	NA
	(2) Intertidal Zone Filtration		NA	NA
	(1) Habitat		LOW	HIGH
	(2) In-stream Habitat		LOW	HIGH
	(3) Baseflow		MEDIUM	MEDIUM
	(3) Substrate		MEDIUM	MEDIUM
	(3) Stream Stability		MEDIUM	MEDIUM
	(3) In-stream Habitat		LOW	HIGH
	(2) Stream-side Habitat		HIGH	HIGH
	(3) Stream-side Habitat		HIGH	HIGH
	(3) Stream-side Habitat (3) Thermoregulation			HIGH
	(3) Thermoregulation (2) Tidal Marsh In-stream Habitat		HIGH	
	. ,		NA NA	NA NA
	(3) Flow Restriction		NA NA	NA NA
	(3) Tidal Marsh Stream Stability		NA NA	NA NA
	(4) Tidal Marsh Channel Stability		NA	NA
	(4) Tidal Marsh Stream Geomorpholog	Эу	NA	NA
	(3) Tidal Marsh In-stream Habitat		NA	NA NA
	(2) Intertidal Zone		NA	NA

LOW

MEDIUM

Overall

		ACC	ompanies oser i	nanuai version z. i	
US	SACE AID #:			NCDWR #:	
INS	STRUCTIONS: Attach a s	ketch of the assessment	area and photogra	aphs. Attach a copy of the USG	S 7.5-minute topographic quadrangle,
and	d circle the location of the	stream reach under evalu	uation. If multiple	stream reaches will be evaluat	ed on the same property, identify and
nur	mber all reaches on the att	tached map, and include a	a separate form fo	r each reach. See the NC SAM	User Manual for detailed descriptions
					asurements were performed. See the
	SAM User Manual for exa				
NC	TE EVIDENCE OF STRE	SSORS AFFECTING TH	E ASSESSMENT	AREA (do not need to be wit	hin the assessment area).
PR	OJECT/SITE INFORMAT	ION:			
	Project name (if any):	U-5706- Stream SH		2. Date of evaluation: 1807	
	Applicant/owner name:	NCDOT		4. Assessor name/organization	: Perkinson/Axiom
	County:	Richmond		6. Nearest named water body	
	River basin:	Yadkin-PeeDee		on USGS 7.5-minute quad:	Hitchcock Creek
	Site coordinates (decimal of	-			
	REAM INFORMATION: (d				
	Site number (show on atta			ength of assessment reach eva	` '
	. Channel depth from bed				Unable to assess channel depth.
	. Channel width at top of b			assessment reach a swamp stea	am? ∐Yes ⊠No
	. Feature type: Perenni		w ∐∃idal Marsh	Stream	
_	REAM CATEGORY INFO		□ B' . I (5	N N N N N N N N N N N N N N N N N N N	
15.	. NC SAM Zone:	☐ Mountains (M)	☐ Piedmont (P) Inner Coastal Plain (I)	Outer Coastal Plain (O)
				\	
16.	. Estimated geomorphic	⊠A C		/ □B	
	valley shape (skip for Tidal Marsh Stream):	(more sinuous strear	m flattor vallov ek		stream, steeper valley slope)
	,	,	•	. ,	
17.	. Watershed size: (skip	☐Size 1 (< 0.1 mi²)	⊠Size 2 (0.1 t	$co < 0.5 \text{ mi}^2$) Size 3 (0.5 to	o < 5 mi²)
^ D	for Tidal Marsh Stream) DITIONAL INFORMATIO				
			: □No If Yes ch	eck all that apply to the assess	ment area
10.	Section 10 water	Classified T			tershed (I III III IV V)
	Essential Fish Habitat	_			ers/Outstanding Resource Waters
	☐Publicly owned proper	_ ,	parian buffer rule		_
	☐Anadromous fish	☐303(d) List	'		vironmental Concern (AEC)
	☐Documented presence	of a federal and/or state	listed protected s	pecies within the assessment a	ea.
	List species:				
	☐Designated Critical Ha				<u>_</u>
19.	. Are additional stream info	ormation/supplementary n	neasurements inc	luded in "Notes/Sketch" section	or attached? ☐Yes ⊠No
	Ohannal Water access		. fan Cina 4 atmaa	and Tidal Manak Ctusanus)	
1.	✓A Water throughout		o for Size 1 Strea	ms and Tidal Marsh Streams)	
	B No flow, water in				
	☐C No water in asso				
2		-ti	abatu:a		
2.	Evidence of Flow Restri			fla-pool soguence is soverely a	fected by a flow restriction or fill to the
					or impoundment on flood or ebb within
					ct the channel, tidal gates, debris jams,
	beaver dams).	, ,	·	•	, , ,
	☐B Not A				
3.	Feature Pattern – asses	sment reach metric			
	☑A A majority of the	assessment reach has a	altered pattern (ex	amples: straightening, modificat	ion above or below culvert).
	☐B Not A				,
4.	Feature Longitudinal Pr	ofile = assessment reac	h metric		
٠.				ream profile (examples: channe	el down-cutting, existing damming, over
					e has not reformed from any of these
	disturbances).	. 5 5			,
	☐B Not A				
5.	Signs of Active Instabili	ty – assessment reach i	metric		
				he stream has currently reco	vered. Examples of instability include
	active bank failure, active	channel down-cutting (he			(such as concrete, gabion, rip-rap).
	⊠A < 10% of channel				
	☐B 10 to 25% of change				
	□C > 25% of channel	ei unsiadie			

ь.				raction – Bank (I B	streamsions) and the					
	LB	RB		•	•	•	` '			
	□A □B ⊠C	□A □B ⊠C	Moo refe or ii	derate evi erence inte ntermitten	dence of ceraction (ex t bulkhead	conditions xamples: ls, causev	limited streams ways with floodp	rms, levee ide area a blain const	es, down- ccess, dis riction, mi	eraction cutting, aggradation, dredging) that adversely affect auting, aggradation, dredging) that adversely affect area, leak inor ditching [including mosquito ditching]) eraction (little to no floodplain/intertidal zone acces
	<u> </u>		[exa of fl mos	amples: canonical canonica	auseways through st :hing]) <u>or</u> f	with flood reamside	dplain and chann area] <u>or</u> too mu	nel constric ch floodpla	ction, bulk ain/intertic	theads, retaining walls, fill, stream incision, disruptio dal zone access [examples: impoundments, intensivor assessment reach is a man-made feature on a
7.	Wate	r Quality	Stresso	ors – asse	essment r	each/inte	ertidal zone me	tric		
	Chec A B C D	Exce Notic	olored w ssive se eable ev	dimentation	on (burying	g of strear discharge	m features or int	tertidal zor	ne)	er discoloration, oil sheen, stream foam) nd causing a water quality problem
	□E	Curre	ent publi				ating degraded	water qua	lity in the	assessment reach. Cite source in "Notes/Sketch
	□F □G □H	Exce	tock with	gae in stre	o stream or inte	rtidal zon	ie	I burning	regular m	nowing, destruction, etc)
	□J	Othe					n in "Notes/Sketo			g, accuracy, c.c,
8.					netric (ski	ip for Tid	al Marsh Strea	ms)		
		Size 1 or 2 Droug Droug	streams ght cond ght cond	s, D1 drou litions <u>and</u>	ght or high I no rainfal	ner is cons II or rainfa		nt; for Size 1 inch wi	thin the la	reams, D2 drought or higher is considered a drough ast 48 hours
9.	Larg e		•		assessme			f Yes, skip	to Metric	c 13 (Streamside Area Ground Surface Condition).
10.							each metric			
	10a.	□Yes	□No	sedime	ntation, m	ining, exc		eam harde	ening [for	nt reach (examples of stressors include excessive example, rip-rap], recent dredging, and snagging to Metric 12)
	10b.	Check a □A □B	Multiple (include	e aquatic i e liverwort	macrophyt s, lichens,	es and ac	quatic mosses Il mats)	Tidal	□F □G	5% oysters or other natural hard bottoms Submerged aquatic vegetation
		_	vegetat	tion			d/or emergent	ck for sh Stre		Low-tide refugia (pools) Sand bottom
		□C □D	5% und	dercut bar		root mate	s and/or roots	Che	□K □K	5% vertical bank along the marsh Little or no habitat
		□E		s extend to no habita		nal wetted	d perimeter			
****	*****	******	*****	**REMAIN	IING QUE	STIONS	ARE NOT APP	LICABLE	FOR TID	AL MARSH STREAMS************************************
11.	Bedf	orm and	Substra	ite – asse	ssment re	each met	ric (skip for Siz	ze 4 Coas	tal Plain	streams and Tidal Marsh Streams)
	11a.	⊠Yes	□No	Is asses	sment rea	ch in a na	itural sand-bed	stream? (s	skip for C	coastal Plain streams)
	11b.	Bedform ⊠A ⊠B □C	Riffle-ru Pool-gl	un section ide section	k the app (evaluate n (evaluat absent (sk	e 11c) e 11d)	box(es). tric 12, Aquatic	: Life)		
	11c.	at least	one box	in each r	ow (skip	for Size 4	4 Coastal Plain	streams a	and Tidal	sessment reach – whether or not submerged. Chec I Marsh Streams) . Not Present (NP) = absent, Rar Predominant (P) = > 70%. Cumulative percentage
					or each as A			(,		, reaching percentage
		\boxtimes	È	Ě			Bedrock/sapro Boulder (256		m)	
			Ħ		Ħ	Ħ	Cobble (64 –	256 mm)	'')	
				\boxtimes		Ħ	Gravel (2 – 64 Sand (.062 –	2 mm)		
				\boxtimes			Silt/clay (< 0.0 Detritus			
	44.		\boxtimes	Ш	. 60 - 1 - 23		Artificial (rip-ra	• •	,	
	11d.	⊠Yes	□No	Are pool	s tilled witl	n sedimer	π? (skip for Siz	ze 4 Coas	tai Plain s	streams and Tidal Marsh Streams)

12.	-		sessment reach metric (skip for Tidal Marsh Streams)
	12a. ⊠ If N		No Was an in-stream aquatic life assessment performed as described in the User Manual? one of the following reasons and skip to Metric 13. ☐No Water ☐Other:
	12b. 🛚	Yes	No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.
	1		Adult frogs
			Aquatic reptiles Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats)
			Beetles Caddisfly larvae (T)
			Asian clam (Corbicula)
			Crustacean (isopod/amphipod/crayfish/shrimp) Damselfly and dragonfly larvae
			Dipterans Mayfly larvae (E)
			Megaloptera (alderfly, fishfly, dobsonfly larvae) Midges/mosquito larvae
			Mosquito fish (Gambusia) or mud minnows (Umbra pygmaea)
			Mussels/Clams (not <i>Corbicula</i>) Other fish
	Ē		Salamanders/tadpoles
			Snails Stonefly larvae (P)
			Tipulid larvae Worms/leeches
13.	Conside	r for the	Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types) Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff.
	LB ∐A	RB ∐A	Little or no alteration to water storage capacity over a majority of the streamside area
	□в ⊠c	∐B ⊠C	Moderate alteration to water storage capacity over a majority of the streamside area Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction,
			livestock disturbance, buildings, man-made levees, drainage pipes)
14.	Conside LB	r for the RB	Water Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Left Bank (LB) and the Right Bank (RB) of the streamside area.
	□A □B ⊠C	□A □B ⊠C	Majority of streamside area with depressions able to pond water ≥ 6 inches deep Majority of streamside area with depressions able to pond water 3 to 6 inches deep Majority of streamside area with depressions able to pond water < 3 inches deep
15.	Conside wetted p	er for the erimeter	e – streamside area metric (skip for Tidal Marsh Streams) Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the normal of assessment reach.
	LB □Y ⊠N	RB □Y ⊠N	Are wetlands present in the streamside area?
16.			outors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams)
	Check a	II contrib	outors within the assessment reach or within view of and draining to the assessment reach.
	□A □B	Ponds (i	and/or springs (jurisdictional discharges) nclude wet detention basins; do not include sediment basins or dry detention basins)
	□C □D		tion passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir) e of bank seepage or sweating (iron in water indicates seepage)
	⊠E □F	Stream	ped or bank soil reduced (dig through deposited sediment if present) the above
17.	Baseflov	w Detrac	tors – assessment area metric (skip for Tidal Marsh Streams)
	Check a ☐A		ply. e of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation)
	□в ⊠c		tion not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit) tream (≥ 24% impervious surface for watershed)
	\Box D	Evidenc	e that the streamside area has been modified resulting in accelerated drainage into the assessment reach
	□E □F		nent reach relocated to valley edge the above
18.			sment reach metric (skip for Tidal Marsh Streams)
	Consider	Stream	Consider "leaf-on" condition. shading is appropriate for stream category (may include gaps associated with natural processes)
	□B □C		ed (example: scattered trees) shading is gone or largely absent

13.	Consider "vetto the first be Vegetated LB RB A A A A B B B C C C	egetate reak. Wood LB B B B	ed buffer" led RB □A ≥ □B F □C F	and "wo 100 fee from 50 t	ooded et wide to < 10		eparately s to the e	y for lef	bank (•	d right	bank	(RB) s	tarting	g at the	top of I	oank ou	Jt
	□D □D □E □E	□D ⊠E				feet wide or no trees												
20.	Buffer Struct Consider for LB RB A A B B C SC D D E	r left ba		nd right st woody v vegetat shrubs	bank ((RB) for M	letric 19 dified veg	("Vege	structur	·e	·							
21.	Buffer Stress Check all ap within 30 feet If none of the Abuts LB RB A A A B B B C C C D D D	propria t of stre	ate boxes at am (< 30 fewing stresset	f or left b eet), or is	cank (Les between curs of curs	B) and rig	ght bank 50 feet of ank, che d turf o livestoo	(RB). stream ck here	ndicate (30-50 and sk	feet). k ip to N	letric 2		s strea	ım (Ab	uts), do	es not a	but but	is
22.	Stem Density Consider for LB RB A A B B C SC	r left ba		nd right nigh stem ensity	bank (n densi	(RB) for M	letric 19	("Wood	led" Bu		ŕ	ound						
23.	Continuity of Consider whe LB RB A A A B B B C C	ether ve		iffer is co ngth of bi ngth of bi	ontinuo uffer bi uffer bi	ous along s reaks is < reaks is be	stream (p 25 perce etween 29	arallel). nt. 5 and 50	Breaks	are ar		king ve	getatio	n > 10	feet wi	de.		
	Vegetative C Evaluate the assessment r LB RB □A □A □B	domina reach h A V W B V S c	ant vegetat	s close tive invasificates This may	n 100 f to undi sive sp s distur y inclu- on-nativ	feet of each isturbed in pecies absorbance in de commo ve invasive	species ent or species terms of unities of e species	presentation prese	edge of and the divers native	the was eir prop sity or p	oortions proporti es that	. Lowe	er strat ut is si	a com till larg	posed of gely contact ar-cutting	of native nposed ig or cle	species of native	s, /e <u>or</u>
		C V W S	egetation with non-na tands of no	s severe tive inva on-charac	ely dist sive sp cteristi	urbed in te becies don c species	erms of s ninant ov or comm	species er a larg unities i	diversity ge portion napprop	on of ex oriately	pected	strata	or con	nmunit	ies com	posed o	of plante	
25.	25a. ☐Yes If No, s	\boxtimes No	essment re o Was conne of the fo	onductivit	ty mea	surement	recorded	l?										
	25b. Check		correspon	_	he con		neasurem	nent (un		crosien		er centil E ≥						
Note	os/Sketch:																	_

Assessment completed on the north side of Richmond Road. South of road the stream is piped through part of the study area, the pipe is failing. On north/west side of the road the channel is incised. Mature trees growing from stream bank, beyond the few mature trees maintained yards abut stream. Stream is intrenched.

Stream Site Name	U-5706- Stream SH	Date of Assessment	180717		
Stream Category	Perkinson/Axiom				
Notes of Field Asses	ssment Form (Y/N)		YES		
Presence of regulator	ory considerations (Y/N)		NO		
Additional stream inf	NO				
NC SAM feature type	e (perennial, intermittent, Tidal N	Marsh Stream)	Perennial		

(pororimal, intermittent, fradi waren etream)	- 1 010111110	<u>. </u>
Function Class Rating Summary	USACE/ All Streams	NCDWR Intermittent
(1) Hydrology	LOW	
(2) Baseflow	MEDIUM	
(2) Flood Flow	LOW	
(3) Streamside Area Attenuation	LOW	
(4) Floodplain Access	LOW	
(4) Wooded Riparian Buffer	LOW	
(4) Microtopography	LOW	
(3) Stream Stability	LOW	
(4) Channel Stability	HIGH	
(4) Sediment Transport	LOW	
(4) Stream Geomorphology	LOW	
(2) Stream/Intertidal Zone Interaction	NA	
. ,	NA NA	
(2) Longitudinal Tidal Flow		
(2) Tidal Marsh Stream Stability	NA NA	
(3) Tidal Marsh Channel Stability	NA NA	
(3) Tidal Marsh Stream Geomorphology	NA	
(1) Water Quality	LOW	
(2) Baseflow	MEDIUM	
(2) Streamside Area Vegetation	MEDIUM	
(3) Upland Pollutant Filtration	LOW	
(3) Thermoregulation	HIGH	
(2) Indicators of Stressors	NO	
(2) Aquatic Life Tolerance	LOW	
(2) Intertidal Zone Filtration	NA	
(1) Habitat	LOW	
(2) In-stream Habitat	LOW	
(3) Baseflow	MEDIUM	
(3) Substrate	MEDIUM	
(3) Stream Stability	MEDIUM	
(3) In-stream Habitat	LOW	
(2) Stream-side Habitat	LOW	
(3) Stream-side Habitat	LOW	
(3) Thermoregulation	MEDIUM	
(2) Tidal Marsh In-stream Habitat	NA NA	
(3) Flow Restriction	NA NA	
(3) Tidal Marsh Stream Stability	NA NA	
(3) Tidal Marsh Channel Stability	NA NA	
	NA NA	
(4) Tidal Marsh Stream Geomorphology (3) Tidal Marsh In-stream Habitat	NA NA	
(3) Intertidal Zone		
	NA LOW	
Overall	LOW	

	Accompanies User Manua	ai version 2.1	
USACE AID #:		NCDWR #:	
INSTRUCTIONS: Attach a s	ketch of the assessment area and photographs.	Attach a copy of the USGS 7	7.5-minute topographic quadrangle,
	stream reach under evaluation. If multiple stream		
	ached map, and include a separate form for each		
	ed information. Record in the "Notes/Sketch" see		
	amples of additional measurements that may be		aremente trere perremieur des une
	SSORS AFFECTING THE ASSESSMENT ARE		the assessment area).
		ar (ao not nota to bo mini	i ino accessment area).
PROJECT/SITE INFORMAT		ate of evaluation: 7/12/20	10
1. Project name (if any):			
3. Applicant/owner name:		ssessor name/organization:	A.Keith/Axiom
5. County:		earest named water body	
7. River basin:		n USGS 7.5-minute quad:	Hitchcock Creek
8. Site coordinates (decimal of	degrees, at lower end of assessment reach):	34.961418, -79.744127	
	depth and width can be approximations)		
9. Site number (show on atta	ched map): Stream SI 10. Lengtl	h of assessment reach evalua	. ,
11. Channel depth from bed	(in riffle, if present) to top of bank (feet): 4-7		nable to assess channel depth.
12. Channel width at top of ba		sment reach a swamp steam	? ∐Yes ⊠No
14. Feature type: ⊠Perennia	al flow Intermittent flow ITidal Marsh Stream	m	
STREAM CATEGORY INFO			
15. NC SAM Zone:	☐ Mountains (M) ☐ Piedmont (P)		Outer Coastal Plain (O)
	_	_	_ , ,
16. Estimated geomorphic	\bowtie_{A}	□в	
valley shape (skip for	(_	
Tidal Marsh Stream):	(more sinuous stream, flatter valley slope)	·	eam, steeper valley slope)
17. Watershed size: (skip	\square Size 1 (< 0.1 mi ²) \square Size 2 (0.1 to < 0	.5 mi ²) \square Size 3 (0.5 to <	5 mi²)
for Tidal Marsh Stream)			
ADDITIONAL INFORMATIO			
18. Were regulatory consider	ations evaluated? $oxtimes$ Yes $oxtimes$ No If Yes, check a	all that apply to the assessme	nt area.
☐Section 10 water	☐Classified Trout Waters	☐Water Supply Water	shed (I II III IIV V)
☐Essential Fish Habitat	☐Primary Nursery Area	☐ High Quality Waters	/Outstanding Resource Waters
☐Publicly owned propert	ty NCDWR Riparian buffer rule in effe	ect Nutrient Sensitive W	aters
☐Anadromous fish	☐ 303(d) List		onmental Concern (AEC)
□Documented presence	of a federal and/or state listed protected species	s within the assessment area	
List species:			
□Designated Critical Ha	bitat (list species)		
19. Are additional stream info	ormation/supplementary measurements included	in "Notes/Sketch" section or	attached? ⊠Yes □No
			_
	sment reach metric (skip for Size 1 streams a	nd Tidal Marsh Streams)	
☐A Water throughout	ut assessment reach.		
⊠B No flow, water ir	າ pools only.		
☐C No water in asset	essment reach.		
2. Evidence of Flow Restri	ction – assessment reach metric		
_	assessment reach in-stream habitat or riffle-po-	ol seguence is severely affer	eted by a flow restriction or fill to the
	ting flow <u>or</u> a channel choked with aquatic macr		
	reach (examples: undersized or perched culver		
beaver dams).	Todali (oxampioo: undoroized or perened editor	to, oddoowdyo triat coriotriot	and charmon, tradingation, door to jame,
⊠B Not A			
3. Feature Pattern – asses			
	e assessment reach has altered pattern (example	es: straightening, modification	above or below culvert).
☐B Not A			
4. Feature Longitudinal Pro	ofile – assessment reach metric		
_	ssment reach has a substantially altered stream	profile (examples: channel of	lown-cutting, existing damming, over
	e aggradation, dredging, and excavation where		
disturbances).	and the state of t		31 12 12 13 14 15 16 16 16 16 16 16 16 16 16 16 16 16 16
☐B Not A			
	tu aaaaamant raaah		
_	ty – assessment reach metric	woom hoo surrently reserve	rad Everyles of instability in the ter-
	nstability, not past events from which the st		
□A < 10% of channe	channel down-cutting (head-cut), active widenin	ig, and artificial flatuering (St	ion as concrete, gabion, np-rap).
☐B 10 to 25% of channe			
⊠C > 25% of channel			

ь.	Streamside Area interaction – streamside area metric Consider for the Left Bank (LB) and the Right Bank (RB).											
	LB	RB	ile Leit	Dank (LD	, and the	Kigiit Da	iik (IVD).					
	□A □B ⊠C	□A □B ⊠C	Mod refe or in Exte [exa of fle	derate evi- erence intentermitten ensive evi- amples: ca ood flows	dence of or eraction (e t bulkhead dence of or auseways through st	conditions xamples: ds, causev conditions with flood treamside	limited streaways with flos that advers dplain and charea] or too	ber amsid odpl sely a nanne muc	ms, leve de area a ain cons affect ref el constr h floodpl	es, on the contraction of the co	down-oss, dis on, min ce inte n, bulkl ntertid	eraction cutting, aggradation, dredging) that adversely affect ruption of flood flows through streamside area, leaky nor ditching [including mosquito ditching]) eraction (little to no floodplain/intertidal zone access heads, retaining walls, fill, stream incision, disruption al zone access [examples: impoundments, intensive or assessment reach is a man-made feature on an
			inte	rstream d	ivide							
7.	Water	Quality	Stresso	ors – asse	essment i	reach/inte	ertidal zone	met	ric			
	Checl A B C D D E	B Excessive sedimentation (burying of stream features or intertidal zone) Noticeable evidence of pollutant discharges entering the assessment reach and causing a water quality problem Odor (not including natural sulfide odors)										
	□F				o stream							
	□G				am or inte			امريما	h			auting destruction atal
	∏H ⊠I	Othe					n in "Notes/S				ular m	owing, destruction, etc)
	ΞJ		to no str			_ (0/40/0//			0000	,		
8.		B Drought conditions and rainfall exceeding 1 inch within the last 48 hours										
9.	Large ☐Yes				assessmo oo large o			s? If	Yes, ski	p to l	Metric	13 (Streamside Area Ground Surface Condition).
10.	Natur	al In-stre	eam Hab	oitat Type	s – asses	ssment re	each metric					
	10a. Yes No Degraded in-stream habitat over majority of the assessment reach (examples of stressors include excessive sedimentation, mining, excavation, in-stream hardening [for example, rip-rap], recent dredging, and snagging) (evaluate for Size 4 Coastal Plain streams only, then skip to Metric 12)											
		Check al □A □B □C □D □D	Multiple (include Multiple vegetat Multiple 5% und in bank	e aquatic re liverwort e sticks ar ion e snags ar dercut bar	macrophytes, lichens, and/or leaf logs (in a logs (in a logs to the norrows)	tes and ac , and alga packs and cluding la root mate	quatic mosse I mats) d/or emerge	es ent	Check for Tidal ea Marsh Streams (upper only)]F]G]H]I]J	ize 4 Coastal Plain streams) 5% oysters or other natural hard bottoms Submerged aquatic vegetation Low-tide refugia (pools) Sand bottom 5% vertical bank along the marsh Little or no habitat
****	*****	******	*****	**DEM		SHONE	APE NOT A	DDI	ICABI E	EO	חוד פ	AL MARSH STREAMS************************************
44												
11.		_										streams and Tidal Marsh Streams)
		⊠Yes						ed s	tream? (skip	tor C	oastal Plain streams)
		Bedform ⊠A ⊠B □C	Riffle-ru Pool-gli	un section ide section	k the app (evaluate n (evaluat absent (sl	e 11c) te 11d)	box(es). tric 12, Aqu	atic	Life)			
		at least (R) = preshould no NP	esent but esen but esent but esen but ese	in each r t ≤ 10%, 0 d 100% fo C □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	cow (skip Common (or each as A \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	for Size 4 (C) = > 10 ssessment P	4 Coastal PI 0-40%, Abur t reach. Bedrock/s Boulder (2 Cobble (6 Gravel (2 Sand (.06. Silt/clay (< Detritus Artificial (r	ain sapro 256 – 4 – 2 – 64 2 – 2 < 0.0	streams t (A) = > blite - 4096 m 256 mm) mm) 2 mm) 62 mm)	and 40-7 im)	Tidal 70%, F	essment reach – whether or not submerged. Check Marsh Streams) . Not Present (NP) = absent, Rare Predominant (P) = > 70%. Cumulative percentages
	11d.	□Yes	\boxtimes No	Are pool	s filled wit	h sedimer	nt? (skip for	Size	e 4 Coas	stal F	Plain s	streams and Tidal Marsh Streams)

12.	-		ssessment reach metric (skip for Tidal Marsh Streams)
	12a. ⊠ If N	_	No Was an in-stream aquatic life assessment performed as described in the User Manual? tone of the following reasons and skip to Metric 13. \(\subseteq No Water \subseteq Other: \)
	12b. 🗌	Yes ∑	No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all the apply. If No, skip to Metric 13.
	1		Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams.]Adult frogs]Aquatic reptiles
			Aquatic replices Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats) Beetles
			Caddisfly larvae (T) Asian clam (<i>Corbicula</i>)
			Crustacean (isopod/amphipod/crayfish/shrimp) Damselfly and dragonfly larvae
			Dipterans Mayfly larvae (E)
			Megaloptera (alderfly, fishfly, dobsonfly larvae) Midges/mosquito larvae
			Mosquito fish (<i>Gambusia</i>) or mud minnows (<i>Umbra pygmaea</i>) Mussels/Clams (not <i>Corbicula</i>)
	Ä		Other fish Salamanders/tadpoles
			Snails Stonefly larvae (P)
			Tipulid larvae]Worms/leeches
13.			Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types) Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runof
	□A ⊠B	∏A ⊠B	Little or no alteration to water storage capacity over a majority of the streamside area Moderate alteration to water storage capacity over a majority of the streamside area
	C	□C	Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction livestock disturbance, buildings, man-made levees, drainage pipes)
14.			Water Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Left Bank (LB) and the Right Bank (RB) of the streamside area.
	□A □B ⊠C	□A □B ⊠C	Majority of streamside area with depressions able to pond water ≥ 6 inches deep Majority of streamside area with depressions able to pond water 3 to 6 inches deep Majority of streamside area with depressions able to pond water < 3 inches deep
15.	Conside wetted p	er for the erimeter	ce - streamside area metric (skip for Tidal Marsh Streams) Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the norma of assessment reach.
	LB □Y ⊠N	RB □Y ⊠N	Are wetlands present in the streamside area?
16.	Baseflo	w Contri	butors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams)
	\square A	Streams	butors within the assessment reach or within view of and draining to the assessment reach. s and/or springs (jurisdictional discharges)
	□B □C □D ⊠E □F	Obstruct Evidence Stream	include wet detention basins; do not include sediment basins or dry detention basins) tion passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir te of bank seepage or sweating (iron in water indicates seepage) bed or bank soil reduced (dig through deposited sediment if present) the above
17.	Baseflov	w Detrac	tors – assessment area metric (skip for Tidal Marsh Streams)
	Check a A B C C	Evidend Obstruc	tion not passing flow during low-flow periods affecting the assessment reach (includes areas excavated for pump installation) tream (≥ 24% impervious surface for watershed)
	□D ⊠E □F	Assessi	te that the streamside area has been modified resulting in accelerated drainage into the assessment reach ment reach relocated to valley edge the above
18.	_		ssment reach metric (skip for Tidal Marsh Streams) Consider "leaf-on" condition.
	□A ⊠B □C	Stream Degrad	shading is appropriate for stream category (may include gaps associated with natural processes) ed (example: scattered trees) shading is gone or largely absent

19.	Buffer Width – streamside area metric (skip for Tidal Marsh Streams) Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out to the first break.										
	Vegetated Wooded LB RB LB RB ⊠A □A □A □A □D □D<										
20.	. Buffer Structure – streamside area metric (skip for Tidal Marsh Streams) Consider for left bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width).										
	LB RB □ A Mature forest □ B □ B Non-mature woody vegetation or modified vegetation structure □ C □ C Herbaceous vegetation with or without a strip of trees < 10 feet wide □ D □ D Maintained shrubs										
21	□E □E Little or no vegetation Buffer Stressors – streamside area metric (skip for Tidal Marsh Streams)										
	Check all appropriate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is within 30 feet of stream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet). If none of the following stressors occurs on either bank, check here and skip to Metric 22: Abuts < 30 feet 30-50 feet										
	LB RB LB RB LB RB \[\text{A} \text{A} \text{A} \text{A} \text{A} \text{A} \text{Row crops} \]										
	□B □B □B □B □B Maintained turf □C □C □C □C □C Pasture (no livestock)/commercial horticulture										
	D D D D Pasture (active livestock use)										
22.	Stem Density – streamside area metric (skip for Tidal Marsh Streams) Consider for left bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width). LB RB										
	 □A										
23.	Continuity of Vegetated Buffer – streamside area metric (skip for Tidal Marsh Streams) Consider whether vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide. LB RB										
	LB RB □ A □ The total length of buffer breaks is < 25 percent. □ B □ B The total length of buffer breaks is between 25 and 50 percent. □ C □ C The total length of buffer breaks is > 50 percent.										
24.	Vegetative Composition – streamside area metric (skip for Tidal Marsh Streams) Evaluate the dominant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to assessment reach habitat.										
	LB RB A Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species,										
	with non-native invasive species absent or sparse. Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or communities with non-native invasive species present, but not dominant, over a large portion of the expected strata or										
	communities missing understory but retaining canopy trees. Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent <u>or</u> communities with non-native invasive species dominant over a large portion of expected strata <u>or</u> communities composed of planted stands of non-characteristic species <u>or</u> communities inappropriately composed of a single species <u>or</u> no vegetation.										
25.	Conductivity – assessment reach metric (skip for all Coastal Plain streams) 25a. Yes No Was conductivity measurement recorded? If No, select one of the following reasons. No Water Other:										
	25b. Check the box corresponding to the conductivity measurement (units of microsiemens per centimeter). $\Box A < 46 \Box B 46 \text{ to} < 67 \Box C 67 \text{ to} < 79 \Box D 79 \text{ to} < 230 \Box E \geq 230$										
Note	es/Sketch:										
Urba	an stream flowing between two maintained residential yards. Incised with no streamside interaction.										

Stream Site Name	U-5706, Stream SI	Date of Assessment	7/12/2018					
Stream Category	A.Keith/Axiom							
Notes of Field Asses		YES						
Presence of regulator	ory considerations (Y/N)		NO					
Additional stream information/supplementary measurements included (Y/N) YES								
NC SAM feature type	e (perennial, intermittent, Tidal N	Marsh Stream)	Perennial					

q · · · · · · · · · · · · · · · · · · ·		
Function Class Rating Summary	USACE/ All Streams	NCDWR Intermittent
(1) Hydrology	LOW	
(2) Baseflow	LOW	
(2) Flood Flow	LOW	
(3) Streamside Area Attenuation	LOW	
(4) Floodplain Access	LOW	
(4) Wooded Riparian Buffer	LOW	
(4) Microtopography	LOW	
(3) Stream Stability	LOW	
(4) Channel Stability	LOW	
(4) Sediment Transport	HIGH	
(4) Stream Geomorphology	LOW	
(2) Stream/Intertidal Zone Interaction	NA NA	
(2) Longitudinal Tidal Flow	NA NA	
(2) Tidal Marsh Stream Stability	NA NA	
(3) Tidal Marsh Channel Stability	NA NA	
(3) Tidal Marsh Stream Geomorphology	NA NA	
(1) Water Quality	LOW	
(2) Baseflow	LOW	
(2) Streamside Area Vegetation	MEDIUM	
(3) Upland Pollutant Filtration	MEDIUM	
(3) Thermoregulation	MEDIUM	
(2) Indicators of Stressors	YES	
• •	LOW	
(2) Aquatic Life Tolerance(2) Intertidal Zone Filtration		
	NA LOW	
(1) Habitat		
(2) In-stream Habitat	LOW	
(3) Substate	LOW	
(3) Substrate	HIGH	
(3) Stream Stability	LOW	
(3) In-stream Habitat	LOW	
(2) Stream-side Habitat	LOW	
(3) Stream-side Habitat	LOW	
(3) Thermoregulation (2) Tidal Marsh In-stream Habitat	LOW	
• •	NA NA	
(3) Flow Restriction	NA NA	
(3) Tidal Marsh Stream Stability	NA NA	
(4) Tidal Marsh Channel Stability	NA NA	
(4) Tidal Marsh Stream Geomorphology	NA NA	
(3) Tidal Marsh In-stream Habitat	NA NA	
(2) Intertidal Zone	NA NA	
Overall	LOW	

		7,00	ompamoe coo		
USACE A	ID #:			NCDWR #:	
INSTRUCT	TIONS: Attach a sl	ketch of the assessment	area and photogi	raphs. Attach a copy of the USGS	7.5-minute topographic quadrangle,
and circle	the location of the	stream reach under eval	uation. If multiple	e stream reaches will be evaluated	d on the same property, identify and
number all	reaches on the atta	ached map, and include a	a separate form f	or each reach. See the NC SAM L	Iser Manual for detailed descriptions
and explar	nations of requeste	d information. Record in	the "Notes/Sket	ch" section if supplementary meas	urements were performed. See the
NC SAM U	Jser Manual for exa	amples of additional meas	surements that m	nay be relevant.	
NOTE EVI	DENCE OF STRES	SSORS AFFECTING TH	E ASSESSMEN	T AREA (do not need to be withi	n the assessment area).
PROJECT	SITE INFORMATI	ON:			
1. Project r	name (if any):	U-5706- Stream SK		2. Date of evaluation: 180717	7
3. Applicar	nt/owner name:	NCDOT		4. Assessor name/organization:	Perkinson/Axiom
5. County:		Richmond		6. Nearest named water body	
7. River ba	asin:	Yadkin-PeeDee		on USGS 7.5-minute quad:	Hitchcock Creek
8. Site coo	ordinates (decimal c	legrees, at lower end of a	assessment reac	h): 34.953309, -79.753081	
	•	lepth and width can be		-	
	nber (show on attac			Length of assessment reach evalu	uated (feet): 150
		in riffle, if present) to top			Jnable to assess channel depth.
	el width at top of ba			assessment reach a swamp stean	
		al flow Intermittent flow			_
	CATEGORY INFO				
15. NC SA		☐ Mountains (M)	☐ Piedmont (P)	Outer Coastal Plain (O)
		_	_ `		
40 Fatima		1			
	ited geomorphic shape (skip for	\boxtimes A	$\overline{}$	⊃ □B	
	Marsh Stream):	(more sinuous strear	m flatter valley s	lone) (less sinuous st	ream, steeper valley slope)
	•	•			
	shed size: (skip lal Marsh Stream)	\square Size 1 (< 0.1 mi ²)	⊠Size ∠ (0.1	to $< 0.5 \text{ mi}^2$) Size 3 (0.5 to $<$	(5 mi²)
	IAL INFORMATIOI	M.			
			n □No If Ves o	heck all that apply to the assessme	ent area
	tion 10 water	Classified T			rshed (I I II III IV V)
	ential Fish Habitat	☐Primary Nui			s/Outstanding Resource Waters
	licly owned propert		parian buffer rule		
	dromous fish	☐303(d) List	pariari barior raio		ronmental Concern (AEC)
_			listed protected	species within the assessment are	
	species:				
	ignated Critical Hat	pitat (list species)			
			neasurements in	cluded in "Notes/Sketch" section o	r attached? ⊠Yes □No
1. Channe	el Water – assess	ment reach metric (skip	o for Size 1 strea	ams and Tidal Marsh Streams)	
□A		it assessment reach.		·	
⊠в	No flow, water in				
□c	No water in asse	essment reach.			
2. Eviden	ce of Flow Restric	ction – assessment rea	ch metric		
				ffle-pool sequence is severely affe	ected by a flow restriction or fill to the
	point of obstruct	ing flow or a channel che	oked with aquation	c macrophytes or ponded water or	impoundment on flood or ebb within
					the channel, tidal gates, debris jams,
	beaver dams).				
⊠в	Not A				
3. Feature	e Pattern – assess	sment reach metric			
			altered pattern (e:	xamples: straightening, modificatio	n above or below culvert)
□B	Not A	addoddinone roddin nad c	anoroa panom (o	nampioo. on alginormig, modificatio	Trabovo or bolow outvorty.
_	_	ofile – assessment reac			
□A					down-cutting, existing damming, over
		aggradation, dredging,	and excavation	where appropriate channel profile	has not reformed from any of these
⊠в	disturbances). Not A				
		y – assessment reach			
					ered. Examples of instability include
			ead-cut), active w	videning, and artificial hardening (s	uch as concrete, gabion, rip-rap).
∐A ⊠B	< 10% of channe 10 to 25% of channe				
□C	> 25% of channe				
	- 20 /0 OI OHAIIII	or arrotable			

Ο.		sider for th										
	LB	RB		Jan. (22)	u		().					
	□A ⊠B	⊠A □B	Mod- refer	erate evid ence inter	ence of co action (exa	onditions amples:	limited stre	: berr	ms, leve le area a	es, dowr access, d	n-cutting, aggradation, dred	dging) that adversely affect ugh streamside area, leaky
	□C	□C	Exte [exal of flo mose	nsive evid mples: ca ood flows tl	ence of couseways we have a second of the couse was a second of the couse of the co	onditions vith flood eamside	that adver plain and c area] <u>or</u> too	sely a hanne mucl	ffect ref el constri n floodpl	erence in ction, bu ain/intert	nteraction (little to no flood lkheads, retaining walls, fill idal zone access [example:	olain/intertidal zone access , stream incision, disruption s: impoundments, intensive a man-made feature on an
7.	Wate	r Quality	Stresso	rs – asses	ssment re	ach/inte	rtidal zone	e metr	ric			
		k all that				.t: -l - l	a (:11d	.:4. -1				-t
	□A □B □C	Exces	ssive sec	limentatio	n (burying	of strean	n features	or inte	rtidal zo	ne)	iter discoloration, oil sheen and causing a water quality	
	□D □E		nt publis		ral sulfide llected da		ting degra	ded w	ater qua	ality in th	e assessment reach. Cite	e source in "Notes/Sketch"
	□F	Livest	ock with		stream or							
	□G □H				m or inter- tion in the			noval,	burning	, regular	mowing, destruction, etc)	
	∏I ⊠J	Other					in "Notes/					
8.					etric (skip	for Tida	al Marsh S	tream	ıs)			
		B Drought conditions and rainfall exceeding 1 inch within the last 48 hours										
9.		e or <u>D</u> ang	erous S	tream – a				s? If	Yes, ski	p to Metr	ic 13 (Streamside Area Gr	ound Surface Condition).
10.	Natu	ral In-stre	am Habi	itat Types	- assess	ment re	ach metric	;				
	10a.	□Yes	□No	sedimen	tation, mir	ning, exc	cavation, ir	i-strea	ım hard	ening [fo		ressors include excessive t dredging, and snagging)
	10b.	Check al ☐A	I that oc Multiple	cur (occu	rs if > 5% acrophyte	coverages and ac	e of assess quatic moss	ment ses		skip for □F	Size 4 Coastal Plain strea 5% oysters or other nat	
			(include	liverworts	, lichens, a	and algal			Check for Tidal Marsh Streams Only	□G □H	Submerged aquatic veg Low-tide refugia (pools)	getation
		_	vegetati	on	-		_	0110	sh St		Sand bottom	
					d logs (incl ks and/or r		p trees) s and/or ro	ots	Mar	∐J ∐K	5% vertical bank along Little or no habitat	tne marsn
		_		extend to no habitat		al wetted	l perimeter					
****		****	*****		NO OUTO	TIONS	ADE NOT	4 DDL 1	ICABI E	COD TU		******
											DAL MARSH STREAMS** o streams and Tidal Mars	
• • •		_	_								Coastal Plain streams)	ii Oil Gaillo)
		Bedform							(-	,	
		⊠в	Pool-glid	de section	evaluate (evaluate bsent (ski	:11d)	ric 12, Aq	uatic I	Life)			
	11c.											or not submerged. Check resent (NP) = absent, Rare
		(R) = pre	sent but	<u><</u> 10%, C		c) = > 10	-40%, Abu					. Cumulative percentages
		NP	R_	C C	A	P						
							Bedrock/ Boulder (m)		
							Cobble (6	64 – 2	56 mm)	,		
		П					Gravel (2 Sand (.06	62 – 2	mm)			
							Silt/clay (Detritus	< 0.06	62 mm)			
			\boxtimes				Artificial ((rip-rap	o, concr	ete, etc.)		
	11d.	⊠Yes	□No	Are pools	filled with	sedimen	t? (skip fo	r Size	4 Coas	tal Plain	streams and Tidal Mars	h Streams)

12.			sessment reach metric (skip for Tidal Marsh Streams)
	12a. ⊠ If N	_	No Was an in-stream aquatic life assessment performed as described in the User Manual? one of the following reasons and skip to Metric 13. No Water Other:
	12b. 🛚	Yes	No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.
	1 <u> </u>		Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams. Adult frogs Aquatic reptiles
			Aquatic reptiles Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats) Beetles
	Ä		Caddisfly larvae (T) Asian clam (<i>Corbicula</i>)
			Crustacean (isopod/amphipod/crayfish/shrimp) Damselfly and dragonfly larvae
	H		Dipterans
			Mayfly larvae (E) Megaloptera (alderfly, fishfly, dobsonfly larvae)
			Midges/mosquito larvae Mosquito fish (<i>Gambusia</i>) or mud minnows (<i>Umbra pygmaea</i>)
			Mussels/Clams (not <i>Corbicula</i>) Other fish
			Salamanders/tadpoles Snails
			Stonefly larvae (P) Tipulid larvae
12	Stroams	_	Worms/leeches Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types)
13.			Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff.
	□A ⊠B	⊠A □B	Little or no alteration to water storage capacity over a majority of the streamside area Moderate alteration to water storage capacity over a majority of the streamside area
	C	□c	Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction, livestock disturbance, buildings, man-made levees, drainage pipes)
14. Streamside Area Water Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Consider for the Left Bank (LB) and the Right Bank (RB) of the streamside area. LB RB			
	□A □B ⊠C	□A ⊠B □C	Majority of streamside area with depressions able to pond water ≥ 6 inches deep Majority of streamside area with depressions able to pond water 3 to 6 inches deep Majority of streamside area with depressions able to pond water < 3 inches deep
wetted perimeter of assessment reach.		er for the erimeter o	Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the normal
	LB ⊠Y □N	RB ⊠Y ∏N	Are wetlands present in the streamside area?
			outors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams)
	\square A	Streams	outors within the assessment reach or within view of <u>and</u> draining to the assessment reach. and/or springs (jurisdictional discharges)
	□B □C	Obstruct	nclude wet detention basins; do not include sediment basins or dry detention basins) ion passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir)
	⊠D ⊠E	Stream I	e of bank seepage or sweating (iron in water indicates seepage) bed or bank soil reduced (dig through deposited sediment if present)
17.	☐F Baseflow		the above tors – assessment area metric (skip for Tidal Marsh Streams)
		II that ap	
	□B ⊠C	Obstruct	ion not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit) tream (≥ 24% impervious surface for watershed)
	□D □E	Evidence	e that the streamside area has been modified resulting in accelerated drainage into the assessment reach nent reach relocated to valley edge
	□F	None of	the above
18.	Conside	r aspect.	sment reach metric (skip for Tidal Marsh Streams) Consider "leaf-on" condition.
	⊠a □B	Degrade	shading is appropriate for stream category (may include gaps associated with natural processes) and (example: scattered trees)
	□c	Stream	shading is gone or largely absent

19.	Buffer Width – streamside area metric (skip for Tidal Marsh Streams) Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out to the first break. Vegetated Wooded LB RB LB RB $A A A A A A A A A A A A A A A A A A A$						
20.	Buffer Structure – streamside area metric (skip for Tidal Marsh Streams) Consider for left bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width). LB RB A A Mature forest B B Non-mature woody vegetation or modified vegetation structure C C Herbaceous vegetation with or without a strip of trees < 10 feet wide D D Maintained shrubs E E Little or no vegetation						
21.	Buffer Stressors – streamside area metric (skip for Tidal Marsh Streams) Check all appropriate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is within 30 feet of stream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet). If none of the following stressors occurs on either bank, check here and skip to Metric 22: Abuts < 30 feet 30-50 feet LB RB LB RB A A A A A A A Row crops B B B B B B B Maintained turf C C C C C C Pasture (no livestock)/commercial horticulture D D D D D D D Pasture (active livestock use)						
22.	Stem Density – streamside area metric (skip for Tidal Marsh Streams) Consider for left bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width). LB RB A Medium to high stem density B B Low stem density C C No wooded riparian buffer or predominantly herbaceous species or bare ground						
23.	Continuity of Vegetated Buffer – streamside area metric (skip for Tidal Marsh Streams) Consider whether vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide. LB RB □ A The total length of buffer breaks is < 25 percent. □ B □ B The total length of buffer breaks is between 25 and 50 percent. □ C □ C The total length of buffer breaks is > 50 percent.						
24.	Vegetative Composition – streamside area metric (skip for Tidal Marsh Streams) Evaluate the dominant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to assessment reach habitat. LB RB □A Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species, with non-native invasive species absent or sparse. □B □B Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or communities with non-native invasive species present, but not dominant, over a large portion of the expected strata or communities missing understory but retaining canopy trees. □C □C Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent or communities with non-native invasive species dominant over a large portion of expected strata or communities composed of planted stands of non-characteristic species or communities inappropriately composed of a single species or no vegetation.						
	Conductivity – assessment reach metric (skip for all Coastal Plain streams) 25a. ☐ Yes ☐ No Was conductivity measurement recorded? If No, select one of the following reasons. ☐ No Water ☐ Other: 25b. Check the box corresponding to the conductivity measurement (units of microsiemens per centimeter). ☐ A < 46 ☐ B 46 to < 67 ☐ C 67 to < 79 ☐ D 79 to < 230 ☐ E ≥ 230						

Urban stream with lots of "wrack" and debris. NCSAM completed upstream of road crossing, downstream of culverted crossing stream bed drops several feet. Wetlands on either bank most likely culvert is partially blocked restricting storm events. Lots of rip rap detritus in channel. either side of the road is being regularly maintained.

Stream Site Name	U-5706 -Stream SK	Date of Assessment	180717	
Stream Category	la2	Assessor Name/Organization	Perkinson/Axiom	
Notes of Field Asses	sment Form (Y/N)		YES	
Presence of regulatory considerations (Y/N)			NO	
Additional stream inf	YES			
NC SAM feature type (perennial, intermittent, Tidal Marsh Stream)			Perennial	

(poroninal, intermittent, ridal waren otroam)			
Function Class Rating Summary	USACE/ All Streams	NCDWR Intermittent	
(1) Hydrology	LOW		
(2) Baseflow	LOW		
(2) Flood Flow	MEDIUM		
(3) Streamside Area Attenuation	HIGH		
(4) Floodplain Access	HIGH		
(4) Wooded Riparian Buffer	HIGH		
(4) Microtopography	LOW		
(3) Stream Stability	LOW		
(4) Channel Stability	MEDIUM		
(4) Sediment Transport	LOW		
(4) Stream Geomorphology	MEDIUM		
(2) Stream/Intertidal Zone Interaction	NA NA		
(2) Longitudinal Tidal Flow	NA NA		
(2) Tidal Marsh Stream Stability	NA		
(3) Tidal Marsh Channel Stability	NA		
(3) Tidal Marsh Stream Geomorphology	NA		
(1) Water Quality	LOW		
(2) Baseflow	LOW		
(2) Streamside Area Vegetation	HIGH		
(3) Upland Pollutant Filtration	HIGH		
(3) Thermoregulation	HIGH		
(2) Indicators of Stressors	NO		
(2) Aquatic Life Tolerance	LOW		
(2) Intertidal Zone Filtration	NA		
(1) Habitat	LOW		
(2) In-stream Habitat	LOW		
(3) Baseflow	LOW		
(3) Substrate	MEDIUM		
(3) Stream Stability	MEDIUM		
(3) In-stream Habitat	LOW		
(2) Stream-side Habitat	HIGH		
(3) Stream-side Habitat	HIGH		
(3) Thermoregulation	HIGH		
(3) Tidal Marsh In-stream Habitat	NA		
• •			
(3) Flow Restriction	NA NA		
(3) Tidal Marsh Stream Stability	NA NA		
(4) Tidal Marsh Channel Stability	NA NA		
(4) Tidal Marsh Stream Geomorphology	NA NA		
(3) Tidal Marsh In-stream Habitat	NA NA		
(2) Intertidal Zone	NA		
Overall	LOW		

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USACE AID #:	NCDWR #:
INSTRUCTIONS: Attach	n a sketch of the assessment area and photographs. Attach a copy of the USGS 7.5-minute topographic quadrangle,
and circle the location of	the stream reach under evaluation. If multiple stream reaches will be evaluated on the same property, identify and
number all reaches on th	e attached map, and include a separate form for each reach. See the NC SAM User Manual for detailed descriptions
and explanations of requ	ested information. Record in the "Notes/Sketch" section if supplementary measurements were performed. See the
NC SAM User Manual fo	r examples of additional measurements that may be relevant.
NOTE EVIDENCE OF S	TRESSORS AFFECTING THE ASSESSMENT AREA (do not need to be within the assessment area).
PROJECT/SITE INFORM	MATION:
1. Project name (if any):	U-5706 Stream SL-int 2. Date of evaluation: 180717
3. Applicant/owner name	: NCDOT 4. Assessor name/organization: Axiom/Perkinson
5. County:	Richmond 6. Nearest named water body
7. River basin:	Yadkin-PeeDee on USGS 7.5-minute quad: Hitchcock Creek
	mal degrees, at lower end of assessment reach): 34.951273, -79.755373
·	N: (depth and width can be approximations)
9. Site number (show on	
	ped (in riffle, if present) to top of bank (feet): 1 Unable to assess channel depth.
12. Channel width at top	
	ennial flow SIntermittent flow Tidal Marsh Stream
STREAM CATEGORY II	
15. NC SAM Zone:	Mountains (M) ☐ Piedmont (P) ☐ Inner Coastal Plain (I) ☐ Outer Coastal Plain (O)
15. NO SAIN ZOITE.	Modifications (M) Flectificity (F)
16. Estimated geomorphi	
valley shape (skip fo	- — —
Tidal Marsh Stream): (more sinuous stream, flatter valley slope) (less sinuous stream, steeper valley slope)
17. Watershed size: (ski	p
for Tidal Marsh Stre	eam)
ADDITIONAL INFORMA	
18. Were regulatory cons	siderations evaluated? \(\subseteq \text{Yes} \) \(\subseteq \text{No} \) If Yes, check all that apply to the assessment area.
☐Section 10 water	☐ Classified Trout Waters ☐ Water Supply Watershed (☐ I☐ ☐ II☐ ☐ IV☐ V)
☐Essential Fish Hab	
☐Publicly owned pro	operty NCDWR Riparian buffer rule in effect Nutrient Sensitive Waters
☐Anadromous fish	☐303(d) List ☐CAMA Area of Environmental Concern (AEC)
□Documented prese	ence of a federal and/or state listed protected species within the assessment area.
List species:	
	l Habitat (list species)
Are additional stream	information/supplementary measurements included in "Notes/Sketch" section or attached? ⊠Yes □No
	sessment reach metric (skip for Size 1 streams and Tidal Marsh Streams)
	ghout assessment reach.
	ter in pools only.
☐C No water in	assessment reach.
	estriction – assessment reach metric
☐A At least 109	% of assessment reach in-stream habitat or riffle-pool sequence is severely affected by a flow restriction or fill to the
point of obs	tructing flow or a channel choked with aquatic macrophytes or ponded water or impoundment on flood or ebb within
	nent reach (examples: undersized or perched culverts, causeways that constrict the channel, tidal gates, debris jams,
beaver dam	s).
⊠B Not A	
3. Feature Pattern – as	sessment reach metric
☑A A majority o	f the assessment reach has altered pattern (examples: straightening, modification above or below culvert).
☐B Not A	
4 Footure Lengitudine	al Drofile . coccement reach matric
	Il Profile – assessment reach metric
	assessment reach has a substantially altered stream profile (examples: channel down-cutting, existing damming, over
disturbance	ctive aggradation, dredging, and excavation where appropriate channel profile has not reformed from any of these
☐B Not A	∪ j.
_	ability – assessment reach metric
	ent instability, not past events from which the stream has currently recovered. Examples of instability include
	ctive channel down-cutting (head-cut), active widening, and artificial hardening (such as concrete, gabion, rip-rap).
☐A < 10% of ch	ctive channel down-cutting (head-cut), active widening, and artificial hardening (such as concrete, gabion, rip-rap).
☐A < 10% of ch ☑B 10 to 25% of	ctive channel down-cutting (head-cut), active widening, and artificial hardening (such as concrete, gabion, rip-rap).

6.				raction -						
	Cons LB	ider for t RB	he Left	Bank (LE	3) and the	Right Ba	ink (RB).			
	□A □B	□A □B	Мо	derate evi	idence of c	conditions		rms, leve	es, down-	eraction cutting, aggradation, dredging) that adversely affect cruption of flood flows through streamside area, leaky
	⊠c	⊠c	or i Ext [ex: of f	intermitten tensive evi amples: c lood flows	it bulkhead idence of d auseways through st	ls, causeventions conditions with flood reamside	ways with floodp s that adversely dplain and chann area] <u>or</u> too mud	lain const affect refe el constric ch floodpla	riction, mi erence inte ction, bulk ain/intertic	nor ditching [including mosquito ditching]) eraction (little to no floodplain/intertidal zone access heads, retaining walls, fill, stream incision, disruption lal zone access [examples: impoundments, intensive or assessment reach is a man-made feature on an
				erstream d					,	
7.	Wate	r Quality	Stress	ors – ass	essment r	each/inte	ertidal zone me	tric		
		k all that								
	ΠA									er discoloration, oil sheen, stream foam)
	⊠B □C						m features or int es entering the a			nd causing a water quality problem
	\Box D	Odor	(not inc	cluding nat	tural sulfide	e odors)	_			
	□E	Curre section		ished or c	collected d	ata indica	ating degraded v	water qua	lity in the	assessment reach. Cite source in "Notes/Sketch"
	□F	Lives	tock wit		to stream o					
	□G □H				eam or inte			hurning	regular m	nowing, destruction, etc)
	⊠ı			_	tation in th		n in "Notes/Sketo			owing, destruction, etc)
	□J	Little	to no st	tressors						
8.							al Marsh Stream		0 4	Do la chichia da considerada la la chica
		Drou	streams ght cond	s, Di diou ditions and	gnt or nigr d no rainfa	ler is cons Il or rainfa	sidered a drougr all not exceeding	1 inch wi	thin the la	eams, D2 drought or higher is considered a drought. st 48 hours
	□В	Drou	ght cond	ditions and			1 inch within the			
_	⊠c		_	conditions						
9.	Large ☐Ye		•		assessme oo large or			Yes, skip	to Metric	: 13 (Streamside Area Ground Surface Condition).
10.							each metric	of the e		at reach (everyles of atresport include everyling
	10a.	⊠Yes	□No	sedime	entation, m	iining, ex		am harde	ening [for	nt reach (examples of stressors include excessive example, rip-rap], recent dredging, and snagging) to Metric 12)
	10b.									ize 4 Coastal Plain streams)
		□A			macrophyt ts, lichens,		quatic mosses	Check for Tidal Marsh Streams Only	□F □G	5% oysters or other natural hard bottoms Submerged aquatic vegetation
		□В	Multiple	e sticks a			d/or emergent	k for T h Strea	□H	Low-tide refugia (pools)
		□с	vegeta Multiple		nd logs (in	cluding la	p trees)	arsh O	□J	Sand bottom 5% vertical bank along the marsh
		□Ď	5% un	dercut bar	nks and/or	root mat	s and/or roots	ວັ ຊັ	□ĸ	Little or no habitat
		⊠E		ks extend t r no habita		nal wetted	d perimeter			
		_								
****	*****	******	*****	**REMAIN	NING QUE	STIONS	ARE NOT APPL	ICABLE	FOR TID	AL MARSH STREAMS************************************
11.	Bedfo	orm and	Substra	ate – asse	essment re	each met	ric (skip for Siz	e 4 Coas	tal Plain s	streams and Tidal Marsh Streams)
	11a.	⊠Yes	□No	Is asses	sment rea	ch in a na	atural sand-bed s	stream? (s	skip for C	oastal Plain streams)
	11b.	Bedform ⊠A			k the app		box(es).			
		⊠B			n (evaluat					
		□с	Natura	I bedform	absent (sk	kip to Me	tric 12, Aquatic	Life)		
		at least	one box	k in each i	row (skip	for Size 4	4 Coastal Plain	streams	and Tidal	essment reach – whether or not submerged. Check Marsh Streams) . Not Present (NP) = absent, Rare Predominant (P) = > 70%. Cumulative percentages
		should no	ot_excee	ed 100% fo	or each as	sessmen		(- ()		ger
		NP ⊠	R	C	A	P	Bedrock/sapro	olite		
							Boulder (256 -		m)	
							Cobble (64 – 2			
		\exists				H	Gravel (2 – 64 Sand (.062 – 2			
				\boxtimes			Silt/clay (< 0.0			
			\boxtimes				Detritus Artificial (rip-ra	ap, concre	ete, etc.)	
	11d.	⊠Yes	□No	_	_	_	` '	•	,	streams and Tidal Marsh Streams)

12.	-		sessment reach metric (skip for Tidal Marsh Streams)
	12a. ⊠ If I	_	No Was an in-stream aquatic life assessment performed as described in the User Manual? cone of the following reasons and skip to Metric 13. ☐No Water ☐Other:
	12b. 🗌	Yes ∑	No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.
	1		Adult frogs
			Aquatic reptiles Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats)
			Beetles Caddisfly larvae (T)
			Asian clam (Corbicula)
			Crustacean (isopod/amphipod/crayfish/shrimp) Damselfly and dragonfly larvae
			Dipterans
			Mayfly larvae (E) Megaloptera (alderfly, fishfly, dobsonfly larvae)
			Midges/mosquito larvae Mosquito fish (<i>Gambusia</i>) or mud minnows (<i>Umbra pygmaea)</i>
			Mussels/Clams (not Corbicula)
			Other fish Salamanders/tadpoles
			Snails
			Stonefly larvae (P) Tipulid larvae
	_	_	Worms/leeches
13.			Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types) Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff.
	$\square A$	□A	Little or no alteration to water storage capacity over a majority of the streamside area
	□B ⊠C	∐В ⊠С	Moderate alteration to water storage capacity over a majority of the streamside area Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction livestock disturbance, buildings, man-made levees, drainage pipes)
14.			Water Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Left Bank (LB) and the Right Bank (RB) of the streamside area.
	□A □B ⊠C	□A □B ⊠C	Majority of streamside area with depressions able to pond water ≥ 6 inches deep Majority of streamside area with depressions able to pond water 3 to 6 inches deep Majority of streamside area with depressions able to pond water < 3 inches deep
15.	Conside wetted p	er for the erimeter	ce – streamside area metric (skip for Tidal Marsh Streams) Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the normal of assessment reach.
	LB ⊠Y □N	RB ⊠Y □N	Are wetlands present in the streamside area?
16.	Baseflo	w Contri	outors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams)
	Check a ☐A		outors within the assessment reach or within view of <u>and</u> draining to the assessment reach. s and/or springs (jurisdictional discharges)
	□в	Ponds (include wet detention basins; do not include sediment basins or dry detention basins)
	□C □D		tion passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir) e of bank seepage or sweating (iron in water indicates seepage)
	⊠E □F		bed or bank soil reduced (dig through deposited sediment if present) the above
17.		w Detrac	tors – assessment area metric (skip for Tidal Marsh Streams)
	$\square A$	Evidend	e of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation)
	∏в ⊠С		tion not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit) tream (≥ 24% impervious surface for watershed)
	\Box D	Evidend	e that the streamside area has been modified resulting in accelerated drainage into the assessment reach
	□E □F		nent reach relocated to valley edge the above
18.			sment reach metric (skip for Tidal Marsh Streams)
	Consider A		Consider "leaf-on" condition. shading is appropriate for stream category (may include gaps associated with natural processes)
	□в	Degrade	ed (example: scattered trees)
	$\boxtimes C$	oneam	shading is gone or largely absent

19.	Buffer Width – streamside area metric (skip for Tidal Marsh Streams) Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out to the first break. Vegetated Wooded LB RB LB RB $\triangle A \triangle A$
20.	Buffer Structure – streamside area metric (skip for Tidal Marsh Streams) Consider for left bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width). LB RB A Mature forest B Non-mature woody vegetation or modified vegetation structure C C Herbaceous vegetation with or without a strip of trees < 10 feet wide D D Maintained shrubs E Little or no vegetation
21.	Buffer Stressors – streamside area metric (skip for Tidal Marsh Streams) Check all appropriate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is within 30 feet of stream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet). If none of the following stressors occurs on either bank, check here and skip to Metric 22: Abuts < 30 feet 30-50 feet LB RB LB RB LB RB A A A A A A A A A A A A A A A A A A A
22.	Stem Density – streamside area metric (skip for Tidal Marsh Streams) Consider for left bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width). LB RB A Medium to high stem density B B Low stem density C C No wooded riparian buffer or predominantly herbaceous species or bare ground
23.	Continuity of Vegetated Buffer – streamside area metric (skip for Tidal Marsh Streams) Consider whether vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide. LB RB A The total length of buffer breaks is < 25 percent. B B The total length of buffer breaks is between 25 and 50 percent. C C The total length of buffer breaks is > 50 percent.
24.	Vegetative Composition – streamside area metric (skip for Tidal Marsh Streams) Evaluate the dominant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to assessment reach habitat. LB RB □A Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species, with non-native invasive species absent or sparse. □B B Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or communities with non-native invasive species present, but not dominant, over a large portion of the expected strata or communities missing understory but retaining canopy trees. □C □C Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent or communities with non-native invasive species dominant over a large portion of expected strata or communities composed of planted stands of non-characteristic species or communities inappropriately composed of a single species or no vegetation.
25.	Conductivity – assessment reach metric (skip for all Coastal Plain streams) 25a. ☐ Yes ☐ No Was conductivity measurement recorded? If No, select one of the following reasons. ☐ No Water ☐ Other: 25b. Check the box corresponding to the conductivity measurement (units of microsiemens per centimeter). ☐ A < 46 ☐ B 46 to < 67 ☐ C 67 to < 79 ☐ D 79 to < 230 ☐ E ≥ 230

Narrow stream orginating outside project area and flowing through several regualry maintained residential yards....stream enters culvet in yard and daylights from underneath a private shed a perennial stream

Stream Site Name	U-5706 Stream SL-int	Date of Assessmer	nt 180717	
Stream Category	la2	Assessor Name/Organizatio	n Axiom/Per	kinson
Additional stream in	ssment Form (Y/N) ory considerations (Y/N) formation/supplementary measu e (perennial, intermittent, Tidal I		YES NO YES Intermitter	nt _
	Function Class Rating Sumr	nary	USACE/ All Streams	NCDWR Intermittent
	(1) Hydrology	<u> </u>	LOW	LOW
	(2) Baseflow	<u> </u>	MEDIUM	MEDIUM
	(2) Flood Flow	<u> </u>	LOW	LOW
	(3) Streamside Ar	ea Attenuation	LOW	LOW
	(4) Floodpla	ain Access	LOW	LOW
	(4) Wooded	LOW	LOW	
	(4) Microtop	LOW	LOW	
	(3) Stream Stabili		LOW	LOW
	(4) Channe	I Stability	MEDIUM	MEDIUM
	(4) Sedime	LOW	LOW	
	(4) Stream	LOW	LOW	
	(2) Stream/Intertion	NA	NA	
	(2) Longitudinal Tid	NA	NA	
	(2) Tidal Marsh Str	NA	NA	
	(3) Tidal Ma	NA	NA	
	(3) Tidal Ma	NA	NA	
	(1) Water Quality		LOW	LOW
	(2) Baseflow	_	MEDIUM	MEDIUM
	(2) Streamside Area Ve	getation	MEDIUM	MEDIUM
	(3) Upland Polluta	ant Filtration	HIGH	HIGH
	(3) Thermoregula	tion	LOW	LOW
	(2) Indicators of Stresso	rs	YES	YES
	(2) Aquatic Life Tolerand	-	LOW	NA
	(2) Intertidal Zone Filtration	_	NA	NA
	(1) Habitat		LOW	LOW
	(2) In-stream Habitat	_	LOW	LOW

MEDIUM

MEDIUM

MEDIUM

LOW

LOW

LOW

LOW

NA

NA

NA

NA

NA

NA

NA

LOW

MEDIUM

MEDIUM

MEDIUM

LOW

LOW

LOW

LOW

NA

NA

NA

NA

NA

NA

NA

LOW

(3) Baseflow

(3) Substrate(3) Stream Stability

(2) Stream-side Habitat

(2) Intertidal Zone

Overall

(3) In-stream Habitat

(3) Stream-side Habitat

(3) Tidal Marsh Stream Stability

(3) Tidal Marsh In-stream Habitat

(4) Tidal Marsh Channel Stability

(4) Tidal Marsh Stream Geomorphology

(3) Thermoregulation(2) Tidal Marsh In-stream Habitat

(3) Flow Restriction

	Accompanies 0s	ei Mailuai Veisioii 2. i							
USACE AID #:		NCDWR #:							
	sketch of the assessment area and phot								
and circle the location of the stream reach under evaluation. If multiple stream reaches will be evaluated on the same property, identify and									
number all reaches on the attached map, and include a separate form for each reach. See the NC SAM User Manual for detailed descriptions									
	ed information. Record in the "Notes/SI		urements were performed. See the						
	camples of additional measurements tha								
	ESSORS AFFECTING THE ASSESSMI	ENT AREA (do not need to be within	n the assessment area).						
PROJECT/SITE INFORMAT		0.00 () () () () () ()							
1. Project name (if any):	U-5706- Stream SL (perennial)	2. Date of evaluation: 180717							
3. Applicant/owner name:	NCDOT	4. Assessor name/organization:	Axiom/Perkinson						
5. County:	Richmond	6. Nearest named water body	Litabasalı Ossalı						
7. River basin:	Yadkin-PeeDee	on USGS 7.5-minute quad:	Hitchcock Creek						
I	degrees, at lower end of assessment re								
9. Site number (show on atta	depth and width can be approximation depth and width can be approximation of the can be approximated as a constant of the co	o ns) 10. Length of assessment reach evalu	ated (feet): 150						
	(in riffle, if present) to top of bank (feet)		Inable to assess channel depth.						
12. Channel width at top of the		Is assessment reach a swamp steam							
	ial flow ☐Intermittent flow ☐Tidal Mai		i: Tes Mio						
STREAM CATEGORY INFO		ish Gucani							
15. NC SAM Zone:	☐ Mountains (M) ☐ Piedmor	nt (P) 🛛 Inner Coastal Plain (I)	Outer Coastal Plain (O)						
16.116 67 1111 26116.	in mountains (iii)								
16 Fatimated seamonnie	,								
16. Estimated geomorphic valley shape (skip for	\boxtimes A \smile	→ □B ¬							
Tidal Marsh Stream):	(more sinuous stream, flatter valle	y slope) (less sinuous st	ream, steeper valley slope)						
17. Watershed size: (skip		0.1 to < 0.5 mi ²) \square Size 3 (0.5 to <							
for Tidal Marsh Stream		0.1 10 (0.0 1111)	01111)						
ADDITIONAL INFORMATION	•								
	rations evaluated? XYes No If Yes	s, check all that apply to the assessme	ent area.						
☐Section 10 water	☐Classified Trout Waters		shed (I II III IV V)						
☐Essential Fish Habitat	☐Primary Nursery Area	☐ High Quality Waters	s/Outstanding Resource Waters						
☐Publicly owned prope		rule in effect Nutrient Sensitive W	/aters						
☐Anadromous fish	☐303(d) List		ronmental Concern (AEC)						
	e of a federal and/or state listed protecte	ed species within the assessment area	a.						
List species:									
Designated Critical Ha		:	-#k12						
19. Are additional stream int	ormation/supplementary measurements	included in Notes/Sketch section of	attached? Yes INO						
1. Channel Water – asses	sment reach metric (skip for Size 1 st	reams and Tidal Marsh Streams)							
✓A Water througho		ireanis and ridal marsh offeanis,							
☐B No flow, water									
	sessment reach.								
2. Evidence of Flow Restr	iction – assessment reach metric								
_	f assessment reach in-stream habitat o	r riffle-pool sequence is severely affe	cted by a flow restriction or fill to the						
	cting flow or a channel choked with aqu								
	t reach (examples: undersized or perch								
beaver dams).									
⊠B Not A									
3. Feature Pattern – asses	ssment reach metric								
☑A A majority of th	e assessment reach has altered pattern	(examples: straightening, modification	n above or below culvert).						
☐B Not A									
4. Feature Longitudinal P	rofile – assessment reach metric								
	essment reach has a substantially altere	d stream profile (examples: channel	down-cutting, existing damming, over						
	e aggradation, dredging, and excavation								
disturbances).			,						
☐B Not A									
5. Signs of Active Instabil	ity – assessment reach metric								
	instability, not past events from which	ch the stream has currently recove	ered. Examples of instability include						
active bank failure, active	e channel down-cutting (head-cut), activ								
☐A < 10% of chanr		- 1							
⊠B 10 to 25% of ch									
□C > 25% of chann	nei unstable								

ь.					streams) 3) and the							
	LB	RB	ile Leit	Dank (LL	, and the	i Kigiit Da	iik (IND).					
	□A □B ⊠C	□A □B	Mod refe or in Exte [exa of fle mod	derate evi erence inte ntermitten ensive evi amples: c ood flows squito dito	dence of deraction (extraction (extraction) (extraction) derived the contraction of the c	conditions examples: ds, causev conditions with flood treamside	limited strea ways with floos that adversed plain and chearea] or too	ber odpla ely a anne muc	ms, leve de area a ain const affect refe el constri h floodpl	es, dow ccess, criction, erence ction, b ain/inte	wn-c disr , min inter oulkh ertida	raction sutting, aggradation, dredging) that adversely affect ruption of flood flows through streamside area, leaky nor ditching [including mosquito ditching]) raction (little to no floodplain/intertidal zone access neads, retaining walls, fill, stream incision, disruption al zone access [examples: impoundments, intensive or assessment reach is a man-made feature on an
			inte	rstream d	ivide							
7.	Water	r Quality	Stresso	ors – asse	essment r	reach/inte	ertidal zone	met	ric			
	Checl ☐ A ☐ B ☐ C ☐ D ☐ E	Exce Notic Odor Curre	olored was ssive se eable ev (not inclent publi	dimentation didence of luding nat	on (buryin f pollutant tural sulfid	g of strear discharge le odors)	m features or es entering th	r inte ne as	ertidal zo sessmer	ne) nt reach	h <u>an</u>	r discoloration, oil sheen, stream foam) d causing a water quality problem assessment reach. Cite source in "Notes/Sketch"
	□F	section		h accoss t	to stream	or intortid	al zono					
	∐Ġ				eam or inte							
	\Box H							oval,	burning,	regula	ır mo	owing, destruction, etc)
	□J □I	Othe	r: to no str			_ (explair	n in "Notes/S	ketc	h" sectio	า)		
8.		B Drought conditions and rainfall exceeding 1 inch within the last 48 hours										
9.	Large ☐Yes		•		assessmoo large o			? If	Yes, skip	to Me	etric	13 (Streamside Area Ground Surface Condition).
10.	Natur	al In-stre	eam Hab	oitat Type	s – asses	ssment re	each metric					
	10a.	□Yes	□No	sedime	entation, m	nining, ex		strea	am harde	ening [1	for e	t reach (examples of stressors include excessive example, rip-rap], recent dredging, and snagging) o Metric 12)
		Check a A B C C D E E	Multiple (include Multiple vegetat Multiple 5% und in bank	e aquatic le liverworte sticks aution e snags audercut bar	macrophyits, lichens nd/or leaf nd logs (in nks and/or to the norr	tes and ad , and alga packs and ncluding la r root mat	quatic mosse Il mats) d/or emergei	es nt	Check for Tidal ab Marsh Streams (4) Only	skip fo F G H I J K		ze 4 Coastal Plain streams) 5% oysters or other natural hard bottoms Submerged aquatic vegetation Low-tide refugia (pools) Sand bottom 5% vertical bank along the marsh Little or no habitat
****	*****	*****	*****	**D = NA A IA		CTIONS	ADE NOT A	DDI	ICABI E	COD T		I MADOU CTDF AMC*********************
												L MARSH STREAMS************************************
11.	Bedfo	orm and	Substra	te – asse	ssment r	each met	ric (skip for	Size	e 4 Coas	tal Pla	in s	treams and Tidal Marsh Streams)
	11a.	⊠Yes	□No	Is asses	sment rea	ich in a na	itural sand-b	ed s	tream? (skip fo	r Co	pastal Plain streams)
		Bedform ⊠A ⊠B □C	Riffle-ru Pool-gli	un section ide sectio	k the app (evaluate n (evaluate absent (sl	e 11c) te 11d)	box(es). tric 12, Aqua	atic	Life)			
		at least (R) = preshould no NP	esent but esent but of excee R	t ≤ 10%, 0 td 100% for C	row (skip Common or each as A	for Size 4 (C) = > 10 ssessment P	4 Coastal Pla 0-40%, Abun t reach. Bedrock/si Boulder (2 Cobble (64 Gravel (2 - Sand (.062 Silt/clay (< Detritus Artificial (ri	ain sidant apro 256 – 4 – 2 – 64 2 – 2 : 0.00	streams (A) = > lite - 4096 m (56 mm) mm) (2 mm) (62 mm)	and Tid 40-70% m)	dal I %, P	essment reach – whether or not submerged. Check Marsh Streams). Not Present (NP) = absent, Rare redominant (P) = > 70%. Cumulative percentages
	11d.	⊠Yes	□No	Are pool	s filled wit	ın sedimer	π? (skip for	SIZ	e 4 Coas	tai Pla	ın s	treams and Tidal Marsh Streams)

12.	-		sessment reach metric (skip for Tidal Marsh Streams)
	12a. ⊠ If I	_	No Was an in-stream aquatic life assessment performed as described in the User Manual? one of the following reasons and skip to Metric 13. ☐No Water ☐Other:
	12b. 🛚	Yes [No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.
	1		Adult frogs
			Aquatic reptiles Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats)
			Beetles Caddisfly larvae (T)
			Asian clam (Corbicula)
	H		Crustacean (isopod/amphipod/crayfish/shrimp) Damselfly and dragonfly larvae
			Dipterans
	H		Mayfly larvae (E) Megaloptera (alderfly, fishfly, dobsonfly larvae)
			Midges/mosquito larvae
			Mosquito fish (<i>Gambusia</i>) or mud minnows (<i>Umbra pygmaea)</i> Mussels/Clams (not <i>Corbicula</i>)
			Other fish Salamanders/tadpoles
			Snails
			Stonefly larvae (P) Tipulid larvae
			Worms/leeches
13.			Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types) Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff.
	$\square A$	□A	Little or no alteration to water storage capacity over a majority of the streamside area
	□B ⊠C	∐B ⊠C	Moderate alteration to water storage capacity over a majority of the streamside area Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction, livestock disturbance, buildings, man-made levees, drainage pipes)
14.			Water Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Left Bank (LB) and the Right Bank (RB) of the streamside area.
	□A □B ⊠C	□A □B ⊠C	Majority of streamside area with depressions able to pond water ≥ 6 inches deep Majority of streamside area with depressions able to pond water 3 to 6 inches deep Majority of streamside area with depressions able to pond water < 3 inches deep
15.	Conside wetted p	er for the erimeter	ee – streamside area metric (skip for Tidal Marsh Streams) Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the normal of assessment reach.
	LB ⊠Y □N	RB ⊠Y □N	Are wetlands present in the streamside area?
16.	Baseflo	w Contri	outors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams)
	Check a ☐A		outors within the assessment reach or within view of <u>and</u> draining to the assessment reach. and/or springs (jurisdictional discharges)
	□В	Ponds (nclude wet detention basins; do not include sediment basins or dry detention basins)
	□C □D		tion passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir) e of bank seepage or sweating (iron in water indicates seepage)
	⊠E □F		bed or bank soil reduced (dig through deposited sediment if present) the above
17.	Baseflo	w Detrac	tors – assessment area metric (skip for Tidal Marsh Streams)
	Check a ☐A		ply. e of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation)
	□в ⊠c	Obstruc	tion not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit) tream (≥ 24% impervious surface for watershed)
	\Box D		e that the streamside area has been modified resulting in accelerated drainage into the assessment reach
	□E □F		nent reach relocated to valley edge the above
18.			sment reach metric (skip for Tidal Marsh Streams)
	Conside	r aspect.	Consider "leaf-on" condition.
	□A □B	Degrade	shading is appropriate for stream category (may include gaps associated with natural processes) ed (example: scattered trees)
	$\boxtimes C$	Stream	shading is gone or largely absent

19.	Buffer Width – streamside area metric (skip for Tidal Marsh Streams) Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out to the first break. Vegetated Wooded LB RB LB RB $A A A A A A A A A A A A A A A A A A A$
20.	Buffer Structure – streamside area metric (skip for Tidal Marsh Streams) Consider for left bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width). LB RB A Mature forest B Non-mature woody vegetation or modified vegetation structure C C Herbaceous vegetation with or without a strip of trees < 10 feet wide D D Maintained shrubs E E Little or no vegetation
21.	Buffer Stressors – streamside area metric (skip for Tidal Marsh Streams) Check all appropriate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is within 30 feet of stream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet). If none of the following stressors occurs on either bank, check here and skip to Metric 22: Abuts < 30 feet 30-50 feet LB RB LB RB A A A A A A A A A A A Row crops B B B B B B B Maintained turf C C C C C C C Pasture (no livestock)/commercial horticulture D D D D D D D D Pasture (active livestock use)
22.	Stem Density – streamside area metric (skip for Tidal Marsh Streams) Consider for left bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width). LB RB A A Medium to high stem density B B B Low stem density C C No wooded riparian buffer or predominantly herbaceous species or bare ground
23.	Continuity of Vegetated Buffer – streamside area metric (skip for Tidal Marsh Streams) Consider whether vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide. LB RB \[\text{A} \text{ \text{ \text{A}}} \text{ The total length of buffer breaks is < 25 percent.} \] \[\text{B} \text{ \text{ \text{B}}} \text{ The total length of buffer breaks is between 25 and 50 percent.} \] \[\text{C} \text{ \text{C}} \text{ The total length of buffer breaks is > 50 percent.} \]
24.	Vegetative Composition – streamside area metric (skip for Tidal Marsh Streams) Evaluate the dominant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to assessment reach habitat. LB RB □A □A Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species, with non-native invasive species absent or sparse. □B □B Uegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or communities with non-native invasive species present, but not dominant, over a large portion of the expected strata or communities missing understory but retaining canopy trees. □C □C Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent or communities
25.	with non-native invasive species dominant over a large portion of expected strata <u>or</u> communities composed of planted stands of non-characteristic species <u>or</u> communities inappropriately composed of a single species <u>or</u> no vegetation. Conductivity – assessment reach metric (skip for all Coastal Plain streams) 25a. ☐ Yes ☐ No Was conductivity measurement recorded? If No, select one of the following reasons. ☐ No Water ☐ Other: 25b. Check the box corresponding to the conductivity measurement (units of microsiemens per centimeter). ☐ A < 46 ☐ B 46 to < 67 ☐ C 67 to < 79 ☐ D 79 to < 230 ☐ E ≥ 230

Stream side area recently clear cut, no woody vegetation. Evidence that herbicide applications have been based on observations of dead ligustrum, watershed is urban, draining a large residential area. Perennial origin was unable to be located, no rain in several days, strong baseflow.

Stream Site Name	U-5706 Stream SL (perennial)	Date of Assessment	180717							
Stream Category	la2	Assessor Name/Organization	Axiom/Perkinson							
Notes of Field Asses	sment Form (Y/N)		YES							
Presence of regulato	ry considerations (Y/N)		NO							
Additional stream info	ormation/supplementary measur	rements included (Y/N)								
NC SAM feature type (perennial, intermittent, Tidal Marsh Stream) Perennial										

(pororimal, intormittorit, ridar waron otroain)	1 010111110	<u>. </u>
Function Class Rating Summary	USACE/ All Streams	NCDWR Intermittent
(1) Hydrology	LOW	
(2) Baseflow	MEDIUM	
(2) Flood Flow	LOW	
(3) Streamside Area Attenuation	LOW	
(4) Floodplain Access	LOW	
(4) Wooded Riparian Buffer	LOW	
(4) Microtopography	LOW	
(3) Stream Stability	LOW	
(4) Channel Stability	MEDIUM	
(4) Sediment Transport	LOW	
(4) Stream Geomorphology	LOW	
(2) Stream/Intertidal Zone Interaction	NA NA	
(2) Longitudinal Tidal Flow	NA NA	
(2) Tidal Marsh Stream Stability	NA NA	
(2) Tidal Marsh Channel Stability	NA NA	
	NA NA	
(3) Tidal Marsh Stream Geomorphology	LOW	
(1) Water Quality	MEDIUM	
(2) Baseflow		
(2) Streamside Area Vegetation	MEDIUM	
(3) Upland Pollutant Filtration	HIGH	
(3) Thermoregulation	LOW	
(2) Indicators of Stressors	NO	
(2) Aquatic Life Tolerance	LOW	
(2) Intertidal Zone Filtration	NA	
(1) Habitat	LOW	
(2) In-stream Habitat	LOW	
(3) Baseflow	MEDIUM	
(3) Substrate	MEDIUM	
(3) Stream Stability	MEDIUM	
(3) In-stream Habitat	LOW	
(2) Stream-side Habitat	LOW	
(3) Stream-side Habitat	LOW	
(3) Thermoregulation	LOW	
(2) Tidal Marsh In-stream Habitat	NA	
(3) Flow Restriction	NA	
(3) Tidal Marsh Stream Stability	NA	
(4) Tidal Marsh Channel Stability	NA	
(4) Tidal Marsh Stream Geomorphology	NA	
(3) Tidal Marsh In-stream Habitat	NA	
(2) Intertidal Zone	NA	
Overall	LOW	

	Accompanie	S OSEI Wallual VEISION 2.1							
USACE AID #:		NCDWR #:							
	Attach a sketch of the assessment area and								
	ion of the stream reach under evaluation. If								
number all reaches on the attached map, and include a separate form for each reach. See the NC SAM User Manual for detailed descriptions and explanations of requested information. Record in the "Notes/Sketch" section if supplementary measurements were performed. See the									
	·		irements were performed. See the						
	ual for examples of additional measurements OF STRESSORS AFFECTING THE ASSES		the assessment area).						
PROJECT/SITE IN 1. Project name (if		2. Date of evaluation: 180717							
3. Applicant/owner		4. Assessor name/organization:	Axiom/Perkinson						
5. County:	Richmond	6. Nearest named water body							
7. River basin:	Yadkin-PeeDee	on USGS 7.5-minute quad:	Hitchcock Creek						
8. Site coordinates	(decimal degrees, at lower end of assessme	ent reach): 34.951482 -79.755150							
	ATION: (depth and width can be approximate on attached map): SM	mations) 10.Length of assessment reach evalua	ated (feet): 150						
	from bed (in riffle, if present) to top of bank (nable to assess channel depth.						
	at top of bank (feet): 5	13. Is assessment reach a swamp steam							
	Perennial flow Intermittent flow Tida	al Marsh Stream							
STREAM CATEGO	DRY INFORMATION:								
15. NC SAM Zone:	☐ Mountains (M) ☐ Pied	dmont (P)	Outer Coastal Plain (O)						
		\	,						
16. Estimated geor			ا						
valley shape (s Tidal Marsh St			eam, steeper valley slope)						
17. Watershed size for Tidal Mars	• •	e 2 (0.1 to $<$ 0.5 mi ²) \square Size 3 (0.5 to $<$	5 mi²)						
ADDITIONAL INFO	,								
	/ considerations evaluated? ⊠Yes □No I	If Yes, check all that apply to the assessme	nt area.						
☐Section 10 w			shed (I II III IV V)						
☐Essential Fis	h Habitat Primary Nursery Area		/Outstanding Resource Waters						
☐Publicly own	ed property NCDWR Riparian but	Iffer rule in effect Nutrient Sensitive W	aters						
□Anadromous	_		onmental Concern (AEC)						
	presence of a federal and/or state listed pro	otected species within the assessment area							
List species:	N								
	Critical Habitat (list species)	containaluded in "Nietos/Ckatab" continuos	ottophed2 MVcc DNc						
19. Are additional s	tream information/supplementary measurem	nents included in Notes/Sketch section of	attached? Yes INO						
1. Channel Water	- assessment reach metric (skip for Size	e 1 streams and Tidal Marsh Streams)							
	throughout assessment reach.								
	w, water in pools only.								
☐C No wa	ter in assessment reach.								
	ow Restriction – assessment reach metric								
	st 10% of assessment reach in-stream habit								
	of obstructing flow <u>or</u> a channel choked with								
	sessment reach (examples: undersized or pr dams).	Deficited curverts, causeways that constrict t	ine channel, lidal gales, debris jams,						
⊠B Not A	r damoj.								
	n – assessment reach metric								
	ority of the assessment reach has altered pa	attern (examples: straightening, modification	above or below culvert)						
□B Not A	only of the assessment reach has aftered pa	attern (examples: straighterning, modification	above of below curverty.						
	udinal Bustila								
	udinal Profile – assessment reach metric		lown outting evicting domming ever						
	ty of assessment reach has a substantially a ing, active aggradation, dredging, and exca								
	pances).	availor where appropriate charmer prome i	ias not reformed from any of these						
☐B Not A	,								
5. Signs of Active	Instability – assessment reach metric								
	current instability, not past events from	which the stream has currently recover	red. Examples of instability include						
	ire, active channel down-cutting (head-cut),								
⊠A < 10%	of channel unstable	-							
	25% of channel unstable								
□C > 25%	of channel unstable								

υ.			he Left B									
	LB	RB										
	□A □B	□A □B	Mode refere	erate evid ence inter	ence of coaction (ex	onditions amples:	limited strea	bern msid	ns, leve e area a	es, down- ccess, dis	eraction cutting, aggradation, dred sruption of flood flows throu inor ditching [including mo	igh streamside area, leaky
	⊠C	⊠c	Exter [exan of floo moso	nsive evic nples: ca od flows t	lence of c useways v hrough str ning]) <u>or</u> fl	onditions with flood eamside	that adverse plain and cha area] <u>or</u> too	ely af anne much	fect refe I constric I floodpla	erence int ction, bulk ain/interti	eraction (little to no floodp kheads, retaining walls, fill, dal zone access [examples or assessment reach is a	lain/intertidal zone access stream incision, disruption : impoundments, intensive
7.	Wate	r Quality	Stressor	s – asse	ssment re	each/inte	rtidal zone	metr	ic			
		k all that										
	□A ⊠B						e (milky whi n features oi				er discoloration, oil sheen,	stream foam)
	□C										nd causing a water quality	problem
		Odor	(not inclu	ding natu	ral sulfide	odors)	Cara Inna a			ne e a a	0.11	**************************************
	□E	section		nea or co	ollected da	ita indica	ting degrade	ea wa	ater qua	lity in the	assessment reach. Cite	source in "Notes/Sketch"
	□F	Lives	tock with									
	□G □H		ssive alga					oval t	hurnina	regular n	nowing, destruction, etc)	
	\boxtimes I	Othe	r:				in "Notes/S				iowing, acouraction, etc)	
	□J	Little	to no stre	ssors								
8.							al Marsh Str			2 0 1 4 04	rooma DO drought ar high	
							ll not exceed				reams, D2 drought or highe ast 48 hours	er is considered a drought.
	□в	Droug	ght condit	ions <u>and</u>			I inch within					
_	⊠c		rought cor			_						
9.	Large ☐Ye		g erous St str					? If \	Yes, skip	to Metri	c 13 (Streamside Area Gro	und Surface Condition).
10.							ach metric	~ wido	of the o		nt reach (averagles of at	raaana inaliida ayaaaiira
	iua.	∐Yes	□No	sedimen	tation, mi	ining, exc	cavation, in-	strea	m harde	ening [for	nt reach (examples of str example, rip-rap], recent to Metric 12)	
	10b.										Size 4 Coastal Plain strea	
		□A			acropnyte, , lichens,		luatic mosse mats)	es	Check for Tidal Marsh Streams Only	□F □G	5% oysters or other natu Submerged aquatic veg	
		□в			d/or leaf p	acks and	d/or emerger	nt	k for T h Strea Only	□H	Low-tide refugia (pools)	
		□с	vegetation Multiple		d logs (inc	ludina lar	o trees)		arsh O	□1 □1	Sand bottom 5% vertical bank along t	he marsh
		□Ď	5% unde	rcut bank	s and/or	root mats	s and/or root	ts	ΰŽ	□ĸ	Little or no habitat	
		⊠E		extend to no habitat		al wetted	l perimeter					
		_										
****	*****	******	*****	REMAIN	NG QUES	STIONS A	ARE NOT A	PPLI	CABLE	FOR TID	AL MARSH STREAMS***	******
11.	Bedf	orm and	Substrate	e – asses	sment re	ach metr	ic (skip for	Size	4 Coas	tal Plain	streams and Tidal Marsh	Streams)
	11a.	⊠Yes	□No I	ls assess	ment read	:h in a nat	tural sand-b	ed str	ream? (s	skip for C	Coastal Plain streams)	
	11b.	_	evaluated			•	ox(es).					
		⊠a ⊠B			(evaluate (evaluate							
		□c					ric 12, Aqua	atic L	_ife)			
	11c.	at least	one box i	n each ro	w (skip f	or Size 4	Coastal Pla	ain st	treams a	and Tida	sessment reach – whether I Marsh Streams). Not Pr	esent (NP) = absent, Rare
			esent but of exceed					idant	(A) = > 6	40-70%,	Predominant (P) = > 70%.	Cumulative percentages
		NP	R	<u>C</u>	A	P						
				H	H	H	Bedrock/sa Boulder (2			m)		
							Cobble (64	4 – 25	56 mm)	,		
							Gravel (2 - Sand (.062					
		H			H	H	Silt/clay (<					
			\square		H		Detritus Artificial (ri			ota ota l		
	11-1		_	U ∆ro ≈s =!:	filledtr		•				otroomo en d Tidal Marra	Strooms\
	пa.	⊠Yes	□No /	rie poois	illea with	seamen	ir (skip tor	SIZE	4 Coas	ıaı rıaın	streams and Tidal Marsh	oneams)

12.	-		sessment reach metric (skip for Tidal Marsh Streams)
	12a. ⊠ If N		No Was an in-stream aquatic life assessment performed as described in the User Manual? one of the following reasons and skip to Metric 13. ☐No Water ☐Other:
	12b. 🗌	Yes 🛚	No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.
	1 ⊠ □		Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams. Adult frogs Aquatic reptiles
			Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats) Beetles Caddisfly larvae (T)
			Asian clam (<i>Corbicula</i>) Crustacean (isopod/amphipod/crayfish/shrimp) Damselfly and dragonfly larvae
			Dipterans Mayfly larvae (E)
			Megaloptera (alderfly, fishfly, dobsonfly larvae) Midges/mosquito larvae Mosquito fish (<i>Gambusia</i>) or mud minnows (<i>Umbra pygmaea</i>)
			Mussels/Clams (not <i>Corbicula</i>) Other fish
			Salamanders/tadpoles Snails Stonefly larvae (P)
	_		Tipulid larvae Worms/leeches
13.			Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types) Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff.
	□A □B ⊠C	□A □B ⊠C	Little or no alteration to water storage capacity over a majority of the streamside area Moderate alteration to water storage capacity over a majority of the streamside area Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction, livestock disturbance, buildings, man-made levees, drainage pipes)
14.			Water Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Left Bank (LB) and the Right Bank (RB) of the streamside area.
	□A □B ⊠C	□A □B ⊠C	Majority of streamside area with depressions able to pond water ≥ 6 inches deep Majority of streamside area with depressions able to pond water 3 to 6 inches deep Majority of streamside area with depressions able to pond water < 3 inches deep
15.	Conside wetted p	r for the	e – streamside area metric (skip for Tidal Marsh Streams) Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the normal of assessment reach.
	⊠Y □N	∏Y ⊠N	Are wetlands present in the streamside area?
16.		II contrib Streams Ponds (i	butors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams) butors within the assessment reach or within view of and draining to the assessment reach. and/or springs (jurisdictional discharges) nclude wet detention basins; do not include sediment basins or dry detention basins) ion passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir)
	□D ⊠E □F	Evidenc Stream	e of bank seepage or sweating (iron in water indicates seepage) ped or bank soil reduced (dig through deposited sediment if present) the above
17.	Check a	II that ap	
	□A □B □C □D □E	Obstructure Urban structure Evidence	e of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation) ion not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit) ream (≥ 24% impervious surface for watershed) that the streamside area has been modified resulting in accelerated drainage into the assessment reach nent reach relocated to valley edge
18.	□F	None of	the above sment reach metric (skip for Tidal Marsh Streams)
	_	aspect. Stream	Consider "leaf-on" condition. shading is appropriate for stream category (may include gaps associated with natural processes) id (example: scattered trees)
	⊠c		shading is gone or largely absent

19.	Buffer Width – streamside area metric (skip for Tidal Marsh Streams) Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out to the first break. Vegetated Wooded LB RB LB RB $A A A A A A A A A A A A A A A A A A A$
20.	Buffer Structure – streamside area metric (skip for Tidal Marsh Streams) Consider for left bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width). LB RB A Mature forest B Non-mature woody vegetation or modified vegetation structure C C Herbaceous vegetation with or without a strip of trees < 10 feet wide D D Maintained shrubs E E Little or no vegetation
21.	Buffer Stressors – streamside area metric (skip for Tidal Marsh Streams) Check all appropriate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is within 30 feet of stream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet). If none of the following stressors occurs on either bank, check here and skip to Metric 22: Abuts < 30 feet 30-50 feet LB RB LB RB LB RB A A A A A A A A A A A A B A B A B B B B
22.	Stem Density – streamside area metric (skip for Tidal Marsh Streams) Consider for left bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width). LB RB A Medium to high stem density B B Low stem density C C No wooded riparian buffer or predominantly herbaceous species or bare ground
23.	Continuity of Vegetated Buffer – streamside area metric (skip for Tidal Marsh Streams) Consider whether vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide. LB RB A The total length of buffer breaks is < 25 percent. B B B The total length of buffer breaks is between 25 and 50 percent. C C The total length of buffer breaks is > 50 percent.
24.	Vegetative Composition – streamside area metric (skip for Tidal Marsh Streams) Evaluate the dominant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to assessment reach habitat. LB RB □A Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species, with non-native invasive species absent or sparse. □B B Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or communities with non-native invasive species present, but not dominant, over a large portion of the expected strata or communities missing understory but retaining canopy trees. ☑C ☑C Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent or communities with non-native invasive species dominant over a large portion of expected strata or communities composed of planted
	stands of non-characteristic species <u>or</u> communities inappropriately composed of a single species <u>or</u> no vegetation. Conductivity – assessment reach metric (skip for all Coastal Plain streams) 25a. ☐ Yes ☐ No Was conductivity measurement recorded? If No, select one of the following reasons. ☐ No Water ☐ Other: 25b. Check the box corresponding to the conductivity measurement (units of microsiemens per centimeter). ☐ A < 46 ☐ B 46 to < 67 ☐ C 67 to < 79 ☐ D 79 to < 230 ☐ E ≥ 230

Adjacent to Stream SL. Stream side area recently clear cut, no woody vegetation. Evidence that herbicide applications have been based on observations of dead ligustrum, watershed is urban, draining a large residential area. Perennial origin was unable to be located, no rain in several days, strong baseflow.

Stream Site Name	U-5706 Stream SM	Date of Assessment	180717					
Stream Category	Stream Category la2 Assessor Name/Organization		Axiom/Perkinson					
Notes of Field Asses	sment Form (Y/N)		YES					
Presence of regulator		NO						
Additional stream inf	YES							
NC SAM feature type (perennial, intermittent, Tidal Marsh Stream) Perennial								

(pororimal, intermittent, flaai waren etream)	1 010111110	<u>. </u>
Function Class Rating Summary	USACE/ All Streams	NCDWR Intermittent
(1) Hydrology	LOW	
(2) Baseflow	MEDIUM	
(2) Flood Flow	LOW	
(3) Streamside Area Attenuation	LOW	
(4) Floodplain Access	LOW	
(4) Wooded Riparian Buffer	LOW	
(4) Microtopography	LOW	
(3) Stream Stability	LOW	
(4) Channel Stability	HIGH	
(4) Sediment Transport	LOW	
(4) Stream Geomorphology	LOW	
(2) Stream/Intertidal Zone Interaction	NA NA	
(2) Longitudinal Tidal Flow	NA NA	
· · · · · · · · · · · · · · · · · · ·	NA NA	
(2) Tidal Marsh Stream Stability (3) Tidal Marsh Channel Stability		
. ,	NA NA	
(3) Tidal Marsh Stream Geomorphology	NA LOW	
(1) Water Quality	LOW	
(2) Baseflow	MEDIUM	
(2) Streamside Area Vegetation	MEDIUM	
(3) Upland Pollutant Filtration	HIGH	
(3) Thermoregulation	LOW	
(2) Indicators of Stressors	YES	
(2) Aquatic Life Tolerance	LOW	
(2) Intertidal Zone Filtration	NA	
(1) Habitat	LOW	
(2) In-stream Habitat	LOW	
(3) Baseflow	MEDIUM	
(3) Substrate	MEDIUM	
(3) Stream Stability	MEDIUM	
(3) In-stream Habitat	LOW	
(2) Stream-side Habitat	LOW	
(3) Stream-side Habitat	LOW	
(3) Thermoregulation	LOW	
(2) Tidal Marsh In-stream Habitat	NA	
(3) Flow Restriction	NA	
(3) Tidal Marsh Stream Stability	NA	
(4) Tidal Marsh Channel Stability	NA	
(4) Tidal Marsh Stream Geomorphology	NA	
(3) Tidal Marsh In-stream Habitat	NA	
(2) Intertidal Zone	NA	
Overall	LOW	

	Accompanies see manaar version 21.
USACE AID #:	NCDWR #:
INSTRUCTIONS: Atta	ch a sketch of the assessment area and photographs. Attach a copy of the USGS 7.5-minute topographic quadrangle,
and circle the location	of the stream reach under evaluation. If multiple stream reaches will be evaluated on the same property, identify and
number all reaches on	the attached map, and include a separate form for each reach. See the NC SAM User Manual for detailed descriptions
and explanations of red	quested information. Record in the "Notes/Sketch" section if supplementary measurements were performed. See the
NC SAM User Manual	for examples of additional measurements that may be relevant.
NOTE EVIDENCE OF	STRESSORS AFFECTING THE ASSESSMENT AREA (do not need to be within the assessment area).
PROJECT/SITE INFOR	RMATION:
1. Project name (if any)	
3. Applicant/owner nam	
5. County:	Richmond 6. Nearest named water body
7. River basin:	Yadkin-PeeDee on USGS 7.5-minute quad: Falling Creek
	cimal degrees, at lower end of assessment reach): 34.934901, -79.726055
·	ON: (depth and width can be approximations)
9. Site number (show o	
	n bed (in riffle, if present) to top of bank (feet): 1 Unable to assess channel depth.
12. Channel width at to	
	erennial flow Intermittent flow Tidal Marsh Stream
STREAM CATEGORY	
15. NC SAM Zone:	Mountains (M) ☐ Piedmont (P) ☐ Inner Coastal Plain (I) ☐ Outer Coastal Plain (O)
13. NO SAIVI ZOITE.	initial coastal Flain (1) in the coastal Flain (1) in outer coastal Flain (0)
16. Estimated geomorp	
valley shape (skip	tor —
Tidal Marsh Stream	m): (more sinuous stream, flatter valley slope) (less sinuous stream, steeper valley slope)
17. Watershed size: (sl	kip
for Tidal Marsh St	ream)
ADDITIONAL INFORM	
	nsiderations evaluated? ☐Yes ☐No If Yes, check all that apply to the assessment area.
☐Section 10 water	
☐Essential Fish H	_ , , , ,
☐Publicly owned p	property NCDWR Riparian buffer rule in effect Nutrient Sensitive Waters
☐Anadromous fish	_
□Documented pre	sence of a federal and/or state listed protected species within the assessment area.
List species:	
	cal Habitat (list species)
19. Are additional strea	m information/supplementary measurements included in "Notes/Sketch" section or attached? ⊠Yes □No
	ssessment reach metric (skip for Size 1 streams and Tidal Marsh Streams)
	bughout assessment reach.
	vater in pools only.
☐C No water i	in assessment reach.
	Restriction – assessment reach metric
□A At least 10	0% of assessment reach in-stream habitat or riffle-pool sequence is severely affected by a flow restriction or fill to the
	ostructing flow or a channel choked with aquatic macrophytes or ponded water or impoundment on flood or ebb within
	sment reach (examples: undersized or perched culverts, causeways that constrict the channel, tidal gates, debris jams,
beaver da	ms).
⊠B Not A	
3. Feature Pattern - a	assessment reach metric
☑A A majority	of the assessment reach has altered pattern (examples: straightening, modification above or below culvert).
☐B Not A	
4. Feature Longitudii	nal Profile – assessment reach metric
	f assessment reach has a substantially altered stream profile (examples: channel down-cutting, existing damming, over
	active aggradation, dredging, and excavation where appropriate channel profile has not reformed from any of these
disturband	
☐B Not A	,,.
_	stability – assessment reach metric
	rent instability, not past events from which the stream has currently recovered. Examples of instability include
	active channel down-cutting (head-cut), active widening, and artificial hardening (such as concrete, gabion, rip-rap).
	channel unstable
	of channel unstable
	of channel unstable channel unstable

6.					streamsic					
	LB	RB	ne Lett	Bank (LB	B) and the	Right Ba	nk (RB).			
	□A □B	∏A ⊠B	Mod refe	derate evi	dence of ceraction (ex	conditions xamples:	limited streamsi	rms, leve de area a	es, down- ccess, dis	cutting, aggradation, dredging) that adversely affect ruption of flood flows through streamside area, leaky
	⊠C	□C	Exte [exa of flo mos	ensive evi amples: ca ood flows	idence of causeways through stock thing]) or f	conditions with flood reamside	that adversely a aplain and chann area] <u>or</u> too mud	affect refe el constri ch floodpla	erence inte ction, bulk ain/intertio	nor ditching [including mosquito ditching]) eraction (little to no floodplain/intertidal zone access heads, retaining walls, fill, stream incision, disruption lal zone access [examples: impoundments, intensive or assessment reach is a man-made feature on an
7.	Wate	r Quality	Stresso	ors – asse	essment r	each/inte	ertidal zone met	tric		
		k all that	apply.							
	ΠĀ									er discoloration, oil sheen, stream foam)
	□B						m features or inter-			nd causing a water quality problem
	\Box D	Odor	(not incl	luding nat	ural sulfide	e odors)	_			
	□E	Curre section		shed or c	ollected da	ata indica	ating degraded v	water qua	lity in the	assessment reach. Cite source in "Notes/Sketch"
	□F			h access t	to stream o	or intertida	al zone			
	□G				am or inte					
	□H						al zone (removal, n in "Notes/Sketo			nowing, destruction, etc)
	⊠J		to no str			_ (OXPIGIT	Till Tiologic Choice	71 0001101	.,	
8.	Rece	nt Weath	er – wat	tershed n	netric (ski	p for Tida	al Marsh Strean	ns)		
		ize 1 or 2	streams	s, D1 drou	ght or high	er is cons	sidered a drough	t; for Size	3 or 4 str	eams, D2 drought or higher is considered a drought.
	□A □B						all not exceeding 1 inch within the			st 48 nours
	⊠c			onditions					- C	
9.	Large □Ye		•		assessme			Yes skir	to Metric	: 13 (Streamside Area Ground Surface Condition).
10	_	_			_	_	each metric	. 00, 0p		
			□No	Degrad sedime	led in-streantation, m	am habita iining, exc	at over majority	am harde	ening [for	nt reach (examples of stressors include excessive example, rip-rap], recent dredging, and snagging) to Metric 12)
	10b.							t reach) (s		ize 4 Coastal Plain streams)
		□A			macrophytes, lichens,		quatic mosses	ms	□F □G	5% oysters or other natural hard bottoms Submerged aquatic vegetation
		⊠в					d/or emergent	Check for Tidal Marsh Streams Only	⊟H	Low-tide refugia (pools)
		□с	vegetat		ad logo (in	oludina lo	n troos)	rsh o	□J	Sand bottom
					nd logs (ind nks and/or		s and/or roots	Che Ma	∐K	5% vertical bank along the marsh Little or no habitat
			in bank	s extend t	to the norn		d perimeter	·	_	
		□E	Little of	no habita	ıı					
****	*****	*****	******	**REMAIN	IING QUE	STIONS	ARE NOT APPL	ICABLE	FOR TID	AL MARSH STREAMS************************************
11.	Bedf	orm and	Substra	te – asse	ssment re	each meti	ric (skip for Siz	e 4 Coas	tal Plain s	streams and Tidal Marsh Streams)
	11a.	⊠Yes	∐No	Is asses	sment read	ch in a na	tural sand-bed s	stream? (s	skip for C	oastal Plain streams)
	11b.	Bedform ⊠A			k the appi (evaluate		oox(es).			
		□B			n (evalua te					
		□с					tric 12, Aquatic	Life)		
	11c.	at least of	one box	in each r	row (skip 1	for Size 4	4 Coastal Plain	streams	and Tidal	essment reach – whether or not submerged. Check Marsh Streams) . Not Present (NP) = absent, Rare
					Common (or each as:			t(A) = >	40-70%, F	Predominant (P) = > 70%. Cumulative percentages
		NP	R	C	A	Р				
		\boxtimes	\Box				Bedrock/sapro		~)	
			H	H	H	H	Boulder (256 - Cobble (64 - 2		11)	
							Gravel (2 - 64	mm)		
			\exists	H	H	\square	Sand (.062 – 2 Silt/clay (< 0.0			
							Detritus			
		_		Ш	Ш		Artificial (rip-ra	-		
	11d.	□Yes	\boxtimes No	Are pool	s filled with	h sedimer	nt? (skip for Siz	e 4 Coas	tal Plain s	streams and Tidal Marsh Streams)

12.	-		sessment reach metric (skip for Tidal Marsh Streams)
	12a. ⊠ If I	_	No Was an in-stream aquatic life assessment performed as described in the User Manual? cone of the following reasons and skip to Metric 13. ☐No Water ☐Other:
	12b. 🗌	Yes ∑	No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.
	1		Adult frogs
			Aquatic reptiles Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats)
			Beetles Caddisfly larvae (T)
			Asian clam (Corbicula)
			Crustacean (isopod/amphipod/crayfish/shrimp) Damselfly and dragonfly larvae
			Dipterans Mayfly larvae (E)
			Megaloptera (alderfly, fishfly, dobsonfly larvae)
			Midges/mosquito larvae Mosquito fish (<i>Gambusia</i>) or mud minnows (<i>Umbra pygmaea)</i>
			Mussels/Clams (not <i>Corbicula</i>) Other fish
			Salamanders/tadpoles
			Snails Stonefly larvae (P)
			Tipulid larvae
13.	Streams	ide Area er for the	Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types) Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff.
	LB □A	RB □A	Little or no alteration to water storage capacity over a majority of the streamside area
	□в ⊠С	⊠B □C	Moderate alteration to water storage capacity over a majority of the streamside area Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction,
			livestock disturbance, buildings, man-made levees, drainage pipes)
14.			Water Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Left Bank (LB) and the Right Bank (RB) of the streamside area.
	□A □B ⊠C	□A ⊠B □C	Majority of streamside area with depressions able to pond water ≥ 6 inches deep Majority of streamside area with depressions able to pond water 3 to 6 inches deep Majority of streamside area with depressions able to pond water < 3 inches deep
15.	Conside wetted p	r for the	ce – streamside area metric (skip for Tidal Marsh Streams) Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the normal of assessment reach.
	⊠Y □N	⊠Y □N	Are wetlands present in the streamside area?
16.			outors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams)
	Check a ☐A		outors within the assessment reach or within view of <u>and</u> draining to the assessment reach. s and/or springs (jurisdictional discharges)
	□B □C	Ponds (include wet detention basins; do not include sediment basins or dry detention basins) tion passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir)
	$\boxtimes D$	Evidend	e of bank seepage or sweating (iron in water indicates seepage)
	⊠E □F		bed or bank soil reduced (dig through deposited sediment if present) the above
17.			tors – assessment area metric (skip for Tidal Marsh Streams)
	Check a ☐A		ply. e of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation)
	□B □C		tion not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit) tream (≥ 24% impervious surface for watershed)
	$\boxtimes D$	Evidend	e that the streamside area has been modified resulting in accelerated drainage into the assessment reach
	□E □F		nent reach relocated to valley edge the above
18.	Shading		sment reach metric (skip for Tidal Marsh Streams)
	Consider A		Consider "leaf-on" condition. shading is appropriate for stream category (may include gaps associated with natural processes)
	□в	Degrade	ed (example: scattered trees)
	$\boxtimes C$	Stream	shading is gone or largely absent

19.	19. Buffer Width – streamside area metric (skip for Tidal Marsh Streams) Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank of to the first break.								
	Vegetate LB RI A A B C C C D D D E C D E C D D D D D D D D D	B LB A □A B □B C □C D □C	oded RB A	≥ 100 feet wide From 50 to < 1 From 30 to < 5 From 10 to < 3 < 10 feet wide	50 feet wide 80 feet wide	e of the watershed			
20.	Conside LB □A □B	er for left RB □A ⊠B	Mature fo Non-matu	and right bank rest ire woody veget	(skip for Tidal Marsh (RB) for Metric 19 (" ation or modified vege	Vegetated" Buffer W	/idth).		
	⊠C □D □E	□C □D □E	Maintaine		vith or without a strip of	trees < 10 feet wide			
21.	Check a within 30	all approp feet of st of the foll	riate boxe tream (< 30 lowing stre O feet	s for left bank) feet), or is bety	c (skip for Tidal Marsl (LB) and right bank (I ween 30 to 50 feet of s on either bank, check Row crops Maintained turf Pasture (no livestock Pasture (active livestock	RB). Indicate if listed tream (30-50 feet). there and skip to Months in the management of the manageme	etric 22: 🗌	(Abuts), does not abut but is	
22.		-	Medium to Low stem	and right bank o high stem den density	kip for Tidal Marsh Si ((RB) for Metric 19 (" sity r <u>or</u> predominantly her	Wooded" Buffer Wid	·		
23.	Continu	ity of Veg	getated But vegetated The total The total	iffer – streamsi buffer is continu length of buffer length of buffer	de area metric (skip	for Tidal Marsh Strea allel). Breaks are are and 50 percent.	_	· 10 feet wide.	
24.	Evaluate		inant veget		a metric (skip for Tide) feet of each bank or		ershed (whichever con	nes first) as it contributes to	
	LB □A	RB □A ⊠B	with non-i	Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native s with non-native invasive species absent or sparse.					
	∐В		species. This may inc communities with non-na		sturbance in terms of species diversity or proportions, but is still largely composed of native clude communities of weedy native species that develop after clear-cutting or clearing or ative invasive species present, but not dominant, over a large portion of the expected strata or derstory but retaining canopy trees.				
	⊠C	□с	with non-	native invasive s	species dominant over	a large portion of exp	pected strata or commi	by is absent <u>or</u> communities unities composed of planted pecies <u>or</u> no vegetation.	
25.	25a.	Yes 🛛	No Was	conductivity me	(skip for all Coastal Peasurement recorded? ns. □No Water □Ot	•			
	25b. Cł □ <i>A</i>			onding to the co 46 to < 67	onductivity measureme ☐C 67 to < 79	nt (units of microsiem ☐D 79 to < 230	ens per centimeter). □E ≥ 230		
	es/Sketch am along		wooded st	rip in farm field.					

Stream Site Name	U-5706 Stream SN Date of Assessn	nent 1/10/2019	
Stream Category	la1 Assessor Name/Organiza	ation Axiom Sm	ith/Radecki
Notes of Field Asses	ssment Form (Y/N)	YES	
Presence of regulate	ory considerations (Y/N)	NO	
Additional stream in	formation/supplementary measurements included (Y/N)	YES	<u> </u>
NC SAM feature typ	e (perennial, intermittent, Tidal Marsh Stream)	Intermitter	<u>nt</u>
		USACE/	NCDWR
	Function Class Rating Summary	All Streams	Intermittent
	(1) Hydrology	LOW	LOW
	(2) Baseflow	MEDIUM	MEDIUM
	(2) Flood Flow	LOW	LOW
	(3) Streamside Area Attenuation	LOW	LOW
	(4) Floodplain Access	LOW	LOW
	(4) Wooded Riparian Buffer	MEDIUM	MEDIUM
	(4) Microtopography	LOW	LOW
	(3) Stream Stability	MEDIUM	MEDIUM
	(4) Channel Stability	HIGH	HIGH
	(4) Sediment Transport	HIGH	HIGH
	(4) Stream Geomorphology	LOW	LOW
	(2) Stream/Intertidal Zone Interaction	NA	NA
	(2) Longitudinal Tidal Flow	NA	NA
	(2) Tidal Marsh Stream Stability	NA	NA
	(3) Tidal Marsh Channel Stability	NA	NA
	(3) Tidal Marsh Stream Geomorphology	NA	NA
	(1) Water Quality	LOW	LOW
	(2) Baseflow	MEDIUM	MEDIUM
	(2) Streamside Area Vegetation	LOW	LOW
	(3) Upland Pollutant Filtration	MEDIUM	MEDIUM
	(3) Thermoregulation	LOW	LOW
	(2) Indicators of Stressors	NO	NO
	(2) Aquatic Life Tolerance	LOW	NA
	(2) Intertidal Zone Filtration	NA	NA
	(1) Habitat	LOW	MEDIUM
	(2) In-stream Habitat	MEDIUM	HIGH
	(3) Baseflow	MEDIUM	MEDIUM
	(3) Substrate	HIGH	HIGH
	(3) Stream Stability	MEDIUM	MEDIUM
	(3) In-stream Habitat	LOW	HIGH
	(2) Stream-side Habitat	LOW	LOW
	(3) Stream-side Habitat	LOW	LOW
	(3) Thermoregulation	LOW	LOW
	(2) Tidal Marsh In-stream Habitat	NA NA	NA NA
	(3) Flow Restriction	NA NA	NA NA
		NA NA	NA NA
	(3) Tidal Marsh Stream Stability (4) Tidal Marsh Channel Stability	NA NA	NA NA
		-	NA NA
	(4) Tidal Marsh Stream Geomorphology	NA NA	
	(3) Tidal Marsh In-stream Habitat (2) Intertidal Zone	NA NA	NA NA
	(Z) IIIGIIIGAI ZUITE	NA	NA

Overall

NA

LOW

LOW

		ACC	Jilipailles User i	nanuai version 2.1		
US	SACE AID #:			NCDWR #:		
IN:	STRUCTIONS: Attach a ske	etch of the assessment a	area and photogra	aphs. Attach a copy of the U	SGS 7	7.5-minute topographic quadrangle,
an	d circle the location of the st	tream reach under evalu	uation. If multiple	stream reaches will be eval	uated	on the same property, identify and
nu	mber all reaches on the attac	ched map, and include a	separate form fo	r each reach. See the NC S.	AM Us	ser Manual for detailed descriptions
					neası	rements were performed. See the
	C SAM User Manual for exan					
NC	OTE EVIDENCE OF STRES	SORS AFFECTING TH	E ASSESSMENT	AREA (do not need to be	within	the assessment area).
PF	ROJECT/SITE INFORMATION	ON:				
	Project name (if any):	U-5706 Stream SP-upp	er	2. Date of evaluation: 1/	10/20	
	Applicant/owner name: _	NCDOT		4. Assessor name/organizat	ion:	Axiom Smith/Radecki
	County:	Richmond		6. Nearest named water boo		
	River basin:	Yadkin-PeeDee		on USGS 7.5-minute qua		Falling Creek
	Site coordinates (decimal de	•		· ————————————————————————————————————	34	
ST 9.	FREAM INFORMATION: (de Site number (show on attach	epth and width can be a hed map): Stream SP-u	approximations) pper 10.1	ength of assessment reach	evalua	ated (feet): 100
	. Channel depth from bed (ir			1		nable to assess channel depth.
	. Channel width at top of bar			assessment reach a swamp s	steam	? □Yes ⊠No
	. Feature type: Perennial			•		
	REAM CATEGORY INFOR					
15	. NC SAM Zone:	☐ Mountains (M)	☐ Piedmont (F) Inner Coastal Plain	(I)	Outer Coastal Plain (O)
				\		,
16	. Estimated geomorphic					
	valley shape (skip for	⊠A T		□В		
	Tidal Marsh Stream):	(more sinuous stream	n, flatter valley sl	ope) (less sinuo	us str	eam, steeper valley slope)
17	. Watershed size: (skip	\boxtimes Size 1 (< 0.1 mi ²)	☐Size 2 (0.1 t	$o < 0.5 \text{ mi}^2$) Size 3 (0.5)	5 to <	5 mi²)
	for Tidal Marsh Stream)					
	DDITIONAL INFORMATION					
18	Were regulatory considerat					
	Section 10 water	Classified Ti				shed (I II III IV V)
	☐Essential Fish Habitat ☐Publicly owned property	Primary Nur	sery Area parian buffer rule			/Outstanding Resource Waters
	☐ Anadromous fish	☐303(d) List	dian buller fule			onmental Concern (AEC)
			listed protected s	pecies within the assessmen		
	List species:					
	Designated Critical Habi	itat (list species)				
19	. Are additional stream inform	mation/supplementary m	neasurements inc	luded in "Notes/Sketch" secti	ion or	attached? ∑Yes \No
1.			for Size 1 strea	ms and Tidal Marsh Strean	ns)	
	☑A Water throughout☐B No flow, water in j					
	☐B No flow, water in p					
_						
2.	Evidence of Flow Restrict					
						cted by a flow restriction or fill to the impoundment on flood or ebb within
						the channel, tidal gates, debris jams,
	beaver dams).	ouer (examples) under	5.204 G. po.oou	surverse, educernaye man con		e ename, naar garee, aezne jame,
	⊠B Not A					
3.	Feature Pattern – assessr	ment reach metric				
			ltered pattern (ex	amples: straightening, modifi	icatior	above or below culvert).
	□B Not A			1 3 3		,
4.	Feature Longitudinal Prof	file = assessment reac	h metric			
٦.				ream profile (examples: cha	nnel d	lown-cutting, existing damming, over
						has not reformed from any of these
	disturbances).	55 - /		11 -1 -1 -1 -1 -1 -1 -1 -1		2.2 2.2.3, 2.2.3.000
	☐B Not A					
5.	Signs of Active Instability	/ - assessment reach r	metric			
				he stream has currently re	cove	red. Examples of instability include
	active bank failure, active c	channel down-cutting (he				ich as concrete, gabion, rip-rap).
	⊠A < 10% of channel				•	
	☐B 10 to 25% of char					
	☐C > 25% of channel	unstable				

6.	. Streamside Area Interaction – streamside area metric Consider for the Left Bank (LB) and the Right Bank (RB). LB RB									
	□A □B	∏A ∏B	Moderate ev reference into	idence of con eraction (exar	iditions (e nples: lim	nited streamsion	ms, leved de area a	es, down- ccess, dis	cutting, aggradation, d	redging) that adversely affect nrough streamside area, leaky mosquito ditching!)
	⊠C	⊠c	Extensive ev [examples: of flood flows	idence of cor causeways with through streaching]) or floc	nditions th th floodpla amside ar	nat adversely a ain and channo ea] <u>or</u> too muc	affect refe el constric h floodpla	erence inte ction, bulk ain/intertio	eraction (little to no floo heads, retaining walls, lal zone access [examp	odplain/intertidal zone access fill, stream incision, disruption ples: impoundments, intensive is a man-made feature on an
7.		-	Stressors – ass	essment rea	ch/interti	idal zone met	ric			
	$\square A$		ored water in str						er discoloration, oil she	en, stream foam)
	□B □C		sive sedimentati able evidence o						<u>nd</u> causing a water qua	ality problem
	D DE	Odor (not including na	tural sulfide o	dors)	· ·				Cite source in "Notes/Sketch"
		section	n.				rater qua	iity iii tiie	assessment reach.	The source in Notes/Oreton
	□F □G		ock with access sive algae in stre			zone				
	□I □H	Other:	ded marsh vege o no stressors			one (removal, "Notes/Sketc			owing, destruction, etc	:)
8.			er – watershed i							
	For S ☐A		streams, D1 drou ht conditions <u>an</u>							igher is considered a drought.
	∏B ⊠C	Drougl No dro	ht conditions and bught conditions	d rainfall exce	eding 1 ir	nch within the	last 48 ho	ours		
9.		e or Dange	erous Stream –	assessment	reach m	etric				
	□Ye	_		=	_		Yes, skip	to Metric	: 13 (Streamside Area	Ground Surface Condition).
10.			sedime	ded in-stream entation, mini	n habitat ng, excav	over majority	am harde	ening [for	example, rip-rap], rec	stressors include excessive cent dredging, and snagging)
	10b.								ize 4 Coastal Plain st	
			Multiple aquatic (include liverwor	ts, lichens, ar	nd algal m	nats)	Check for Tidal Marsh Streams Only	□F □G	5% oysters or other r Submerged aquatic v	vegetation
		•	Multiple sticks a vegetation	•			Sk for Sh Stre	□H	Low-tide refugia (pod Sand bottom	ils)
			Multiple snags a 5% undercut ba				Chec	□J □K	5% vertical bank alor Little or no habitat	ng the marsh
		i	in banks extend Little or no habit	to the normal			•	_		
										S********
11.						-			streams and Tidal Ma oastal Plain streams)	•
			evaluated. Chec				ileaili? (S	skip ioi C	oastai Fiaili Streailis,	,
	110.	⊠A I	Riffle-run sectior	n (evaluate 1	1c)	ж(оо).				
			Pool-glide sectic Natural bedform			c 12, Aquatic	Life)			
	11c.	at least or	ne box in each	row (skip for	Size 4 C	oastal Plain	streams a	and Tidal	Marsh Streams). Not	ner or not submerged. Check t Present (NP) = absent, Rare 0%. Cumulative percentages
		should not	t exceed 100% f	or each asses	ssment re		· (A) – > ·	40-7070, r	riedominant (F) = > 70	7/6. Cumulative percentages
		\boxtimes	R C □ □	A F		Bedrock/sapro	lite			
] E	Boulder (256 - Cobble (64 – 2	- 4096 mr 256 mm)	m)		
						Gravel (2 – 64	mm)			
					⊒	Sand (.062 – 2 Silt/clay (< 0.0				
					=	Detritus Artificial (rip-ra	p, concre	ete, etc.)		
	11d.	□Yes	⊠No Are poo	ls filled with s	ediment?	(skip for Size	e 4 Coast	tal Plain s	streams and Tidal Ma	rsh Streams)

12.	-		sessment reach metric (skip for Tidal Marsh Streams)
	12a. ⊠ If N		No Was an in-stream aquatic life assessment performed as described in the User Manual? one of the following reasons and skip to Metric 13. ☐No Water ☐Other:
	12b. 🗌	Yes ⊠	No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.
	1		Adult frogs
			Aquatic reptiles Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats)
			Beetles Caddisfly larvae (T)
			Asian clam (Corbicula)
			Crustacean (isopod/amphipod/crayfish/shrimp) Damselfly and dragonfly larvae
			Dipterans Mayfly larvae (E)
	Ë		Megaloptera (alderfly, fishfly, dobsonfly larvae)
			Midges/mosquito larvae Mosquito fish (<i>Gambusia</i>) or mud minnows (<i>Umbra pygmaea)</i>
			Mussels/Clams (not Corbicula)
	\vdash		Other fish Salamanders/tadpoles
			Snails Stonefly larvae (P)
			Tipulid larvae Worms/leeches
13.	Streams	ide Area	Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types)
	LB	RB	Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff.
	□A □B	□A □B	Little or no alteration to water storage capacity over a majority of the streamside area Moderate alteration to water storage capacity over a majority of the streamside area
	⊠c	⊠c	Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction livestock disturbance, buildings, man-made levees, drainage pipes)
14.			Water Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Left Bank (LB) and the Right Bank (RB) of the streamside area.
	□A □B ⊠C	□A □B ⊠C	Majority of streamside area with depressions able to pond water ≥ 6 inches deep Majority of streamside area with depressions able to pond water 3 to 6 inches deep Majority of streamside area with depressions able to pond water < 3 inches deep
15.	Conside wetted p	er for the erimeter o	 e – streamside area metric (skip for Tidal Marsh Streams) Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the normal of assessment reach.
	LB □Y ⊠N	RB □Y ⊠N	Are wetlands present in the streamside area?
16.	Baseflov		outors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams)
	Check a ☐A		utors within the assessment reach or within view of <u>and</u> draining to the assessment reach. and/or springs (jurisdictional discharges)
	□В	Ponds (i	nclude wet detention basins; do not include sediment basins or dry detention basins)
	□C □D		ion passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir) e of bank seepage or sweating (iron in water indicates seepage)
	⊠E □F	Stream I	ped or bank soil reduced (dig through deposited sediment if present) the above
17.	Baseflov		ors – assessment area metric (skip for Tidal Marsh Streams)
	\square A	Evidence	e of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation)
	□B □C		ion not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit) ream (≥ 24% impervious surface for watershed)
	⊠D □E		e that the streamside area has been modified resulting in accelerated drainage into the assessment reach nent reach relocated to valley edge
	□F		the above
18.			sment reach metric (skip for Tidal Marsh Streams)
	$\square A$	Stream	Consider "leaf-on" condition. shading is appropriate for stream category (may include gaps associated with natural processes)
	⊠B □C		d (example: scattered trees) shading is gone or largely absent

19. Buffer Width – streamside area metric (skip for Tidal Marsh Streams) Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the to to the first break.							
	Vegetated Wooded LB RB LB RB □A □A □A □A □D □D<						
20.	Buffer Structure – streamside area metric (skip for Tidal Marsh Streams) Consider for left bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width). LB RB A Mature forest B B Non-mature woody vegetation or modified vegetation structure C AC Herbaceous vegetation with or without a strip of trees < 10 feet wide D D Maintained shrubs E E Little or no vegetation						
21.	Buffer Stressors – streamside area metric (skip for Tidal Marsh Streams) Check all appropriate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is within 30 feet of stream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet). If none of the following stressors occurs on either bank, check here and skip to Metric 22: Abuts < 30 feet 30-50 feet LB RB LB RB LB RB □A □A □A □A □A □A Row crops □B □B □B □B □B □B Maintained turf □C □C □C □C □C Pasture (no livestock)/commercial horticulture □D □D □D □D □D □D □D □ Pasture (active livestock use)						
22.	Stem Density – streamside area metric (skip for Tidal Marsh Streams) Consider for left bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width). LB RB A Medium to high stem density B B Low stem density C C C No wooded riparian buffer or predominantly herbaceous species or bare ground						
23.	Continuity of Vegetated Buffer – streamside area metric (skip for Tidal Marsh Streams) Consider whether vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide. LB RB A The total length of buffer breaks is < 25 percent. B B B The total length of buffer breaks is between 25 and 50 percent. C C The total length of buffer breaks is > 50 percent.						
24.	Vegetative Composition – streamside area metric (skip for Tidal Marsh Streams) Evaluate the dominant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to assessment reach habitat. LB RB □A Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species, with non-native invasive species absent or sparse. □B □B Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or communities with non-native invasive species present, but not dominant, over a large portion of the expected strata or communities missing understory but retaining canopy trees. □C □C Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent or communities with non-native invasive species dominant over a large portion of expected strata or communities composed of planted stands of non-characteristic species or communities inappropriately composed of a single species or no vegetation.						
25.	Conductivity – assessment reach metric (skip for all Coastal Plain streams) 25a. ☐ Yes ☐ No Was conductivity measurement recorded? If No, select one of the following reasons. ☐ No Water ☐ Other: 25b. Check the box corresponding to the conductivity measurement (units of microsiemens per centimeter). ☐ A < 46 ☐ B 46 to < 67 ☐ C 67 to < 79 ☐ D 79 to < 230 ☐ E ≥ 230						
	es/Sketch: am runs along side residential properties with maintained lawns						

Stream Site Name	U-5706 Stream SP-lower	Date of Assessmen	t 1/10/2019	
Stream Category	la1	Assessor Name/Organization	Axiom Sm	ith/Radecki
Notes of Field Asses	ssment Form (Y/N)		YES	
Presence of regulate	ory considerations (Y/N)		NO	
Additional stream in	YES			
NC SAM feature typ	e (perennial, intermittent, Tidal I	Marsh Stream)	Intermitter	nt .
				<u> </u>
	Function Class Bating Sum	man.	USACE/	NCDWR
	Function Class Rating Sumr (1) Hydrology	nary A	All Streams LOW	Intermittent LOW
	(1) Hydrology (2) Baseflow		MEDIUM	MEDIUM
	` '			
	(2) Flood Flow	<u> </u>	LOW	LOW
	(3) Streamside A		LOW	LOW
	(4) Floodpla		LOW	LOW
		d Riparian Buffer	LOW	LOW
	(4) Microto	<u> </u>	LOW	LOW
	(3) Stream Stabili	ty	MEDIUM	MEDIUM
	(4) Channe	l Stability	HIGH	HIGH
	(4) Sedime	nt Transport	HIGH	HIGH
	(4) Stream	Geomorphology	LOW	LOW
	(2) Stream/Intertion	dal Zone Interaction	NA	NA
	(2) Longitudinal Tio	dal Flow	NA	NA
	(2) Tidal Marsh Str	eam Stability	NA	NA
	* *	rsh Channel Stability	NA	NA
	(3) Tidal Ma	rsh Stream Geomorphology	NA	NA
	(1) Water Quality	, 9,	LOW	LOW
	(2) Baseflow		MEDIUM	MEDIUM
	(2) Streamside Area Ve	 getation	MEDIUM	MEDIUM
	(3) Upland Polluta	· —	MEDIUM	MEDIUM
	(3) Thermoregula		MEDIUM	MEDIUM
	(2) Indicators of Stresso		NO	NO
	(2) Aquatic Life Toleran		LOW	NA
	(2) Intertidal Zone Filtration		NA	NA
	(1) Habitat	···	LOW	MEDIUM
	(2) In-stream Habitat		MEDIUM	HIGH
	(3) Baseflow		MEDIUM	MEDIUM
	(3) Substrate	_	HIGH	HIGH
	(3) Stream Stabili		MEDIUM	MEDIUM
	(3) In-stream Hab		LOW	HIGH
	` '		LOW	
	(2) Stream-side Habitat			LOW
	(3) Stream-side H		LOW	LOW
	(3) Thermoregula		LOW	LOW
	(2) Tidal Marsh In-stream		NA NA	NA NA
	(3) Flow Restriction		NA	NA
	(3) Tidal Marsh Str		NA	NA
		rsh Channel Stability	NA	NA
	(4) Tidal Ma	rsh Stream Geomorphology	NA	NA

(3) Tidal Marsh In-stream Habitat

(2) Intertidal Zone

Overall

NA

NA

LOW

NA

NA

LOW

	7.000	Janioo Goor Manaar Voronon 211	
USACE AID #:		NCDWR #:	
		a and photographs. Attach a copy of the US	
		on. If multiple stream reaches will be evalua	
number all reaches on the at	tached map, and include a se	parate form for each reach. See the NC SAI	M User Manual for detailed descriptions
		"Notes/Sketch" section if supplementary me	easurements were performed. See the
	amples of additional measure		
NOTE EVIDENCE OF STRE	SSORS AFFECTING THE A	SSESSMENT AREA (do not need to be w	thin the assessment area).
PROJECT/SITE INFORMAT	ION:		
1. Project name (if any):	U-5706 Stream SR	2. Date of evaluation: 1/23	3/19
3. Applicant/owner name:	NCDOT	4. Assessor name/organization	n: Smith/Axiom
5. County:	Richmond	6. Nearest named water body	
7. River basin:	Yadkin-PeeDee	on USGS 7.5-minute quad	: Hitchcock Creek
8. Site coordinates (decimal	degrees, at lower end of asse	essment reach): 34.960682, -079.74623	1
STREAM INFORMATION: (depth and width can be app	roximations)	
9. Site number (show on atta		10. Length of assessment reach evan	valuated (feet): 590
11. Channel depth from bed	(in riffle, if present) to top of b	pank (feet): 3	☐Unable to assess channel depth.
12. Channel width at top of b	ank (feet): 5	13. Is assessment reach a swamp sto	eam? □Yes ⊠No
14. Feature type: ☐Perenn	al flow Intermittent flow □	Tidal Marsh Stream	
STREAM CATEGORY INFO			
15. NC SAM Zone:	☐ Mountains (M) ☐	☐ Piedmont (P) ☐ Inner Coastal Plain () Utter Coastal Plain (O)
		1	1
16. Estimated geomorphic	\	,	
valley shape (skip for	\boxtimes A \longrightarrow	□В	\bigcup
Tidal Marsh Stream):	(more sinuous stream, fl	atter valley slope) (less sinuou	s stream, steeper valley slope)
17. Watershed size: (skip		☐Size 2 (0.1 to < 0.5 mi²) ☐Size 3 (0.5 fi	
for Tidal Marsh Stream	` ,		
ADDITIONAL INFORMATION	•		
		No If Yes, check all that apply to the asses	sment area.
☐Section 10 water	☐Classified Trout		atershed (I II III IV V)
 ☐Essential Fish Habitat			aters/Outstanding Resource Waters
Publicly owned proper		an buffer rule in effect Nutrient Sensitiv	<u> </u>
☐Anadromous fish	☐303(d) List		nvironmental Concern (AEC)
☐Documented presence	e of a federal and/or state liste	ed protected species within the assessment	
List species:			
☐Designated Critical Ha	ibitat (list species)		
19. Are additional stream inf	ormation/supplementary mea	surements included in "Notes/Sketch" sectio	n or attached?
		r Size 1 streams and Tidal Marsh Streams	3)
	ut assessment reach.		
☐B No flow, water i	. ,		
☐C No water in ass	essment reach.		
2. Evidence of Flow Restr	iction – assessment reach r	netric	
☐A At least 10% of	assessment reach in-stream	habitat or riffle-pool sequence is severely	affected by a flow restriction or fill to the
point of obstruc	ting flow or a channel choke	d with aquatic macrophytes or ponded wate	r or impoundment on flood or ebb within
	reach (examples: undersize	d or perched culverts, causeways that const	rict the channel, tidal gates, debris jams,
beaver dams).			
⊠B Not A			
3. Feature Pattern – asses	sment reach metric		
☑A A majority of the	e assessment reach has alter	ed pattern (examples: straightening, modification	ation above or below culvert).
☐B Not A			
4. Feature Longitudinal Pr	ofile - assessment reach m	etric	
		ially altered stream profile (examples: chani	nel down-cutting existing damming over
		excavation where appropriate channel pro	
disturbances).		and appropriate original pro	
☐B Not A			
	tu accoment reach met	rio	
_	ity – assessment reach met		evered Evernles of instability include
		from which the stream has currently rec- cut), active widening, and artificial hardening	
⊠A < 10% of chann	5 \	out, active widering, and artificial haldering	y (Saon as concrete, gabion, np-rap).
☐B 10 to 25% of ch			
☐C > 25% of chann			

6.										
Consider for the Left Bank (LB) and the Right Bank (RB). LB RB										
	□A □A Little or no evidence of conditions that adversely affect reference interaction □B □B Moderate evidence of conditions (examples: berms, levees, down-cutting, aggradation, dredging) that adversely affect reference interaction (examples: limited streamside area access, disruption of flood flows through streamside area, leaky									
	⊠C	⊠c	Exte [exa of fl mos	ensive evi amples: ca ood flows	dence of causeways through str ching]) or fl	conditions with flood reamside	that adversely plain and chann area] <u>or</u> too mud	affect refe el constric ch floodpla	rence inte tion, bulk iin/intertid	nor ditching [including mosquito ditching]) eraction (little to no floodplain/intertidal zone access heads, retaining walls, fill, stream incision, disruption lal zone access [examples: impoundments, intensive or assessment reach is a man-made feature on an
7.	Wate	r Quality	Stresso	ors – asse	essment r	each/inte	rtidal zone me	tric		
		k all that								
	ΠA									er discoloration, oil sheen, stream foam)
	□B □C						n features or int s entering the a			nd causing a water quality problem
	\Box D	Odor	(not inc	luding nat	ural sulfide	e odors)	_			
	□E	Curre section		shed or c	ollected da	ata indica	ting degraded v	water qua	ity in the	assessment reach. Cite source in "Notes/Sketch"
	□F			h access t	o stream o	or intertida	al zone			
	□G				am or inte					and the state of the state
				_	ation in the		in "Notes/Sketo			owing, destruction, etc)
	⊠J		to no sti			- (.,	
8.							al Marsh Strea			
		ize 1 or 2	streams	s, D1 droug	ght or high	er is cons	sidered a drough Il not exceeding	nt; for Size	3 or 4 str	eams, D2 drought or higher is considered a drought.
	□A □B						1 inch within the			St 48 Hours
	⊠C			onditions		J				
9.	Large □Ye		•		assessme oo large or			Yes, skip	to Metric	13 (Streamside Area Ground Surface Condition).
10.							ach metric			
	10a.	□Yes	□No	sedime	ntation, mi	ining, exc		am harde	ning [for	nt reach (examples of stressors include excessive example, rip-rap], recent dredging, and snagging) to Metric 12)
	10b.									ize 4 Coastal Plain streams)
		⊠A			s, lichens,		quatic mosses mats)	Check for Tidal Marsh Streams Only	□F □G	5% oysters or other natural hard bottoms Submerged aquatic vegetation
		□В			nd/or leaf p	oacks and	d/or emergent	k for J h Stre Only	H	Low-tide refugia (pools)
		□с	vegetat Multiple		nd logs (inc	cluding lap	p trees)	heck arsh	□1 □I	Sand bottom 5% vertical bank along the marsh
		□D					and/or roots	ပ ≥	□K	Little or no habitat
	in banks extend to the normal wetted perimeter ☐E Little or no habitat									
****	******	******	******	**REMAIN	IING QUE	STIONS	ARE NOT APPI	ICABLE	FOR TID	AL MARSH STREAMS************************************
11.	Bedfo	orm and	Substra	ite – asse	ssment re	each meti	ric (skip for Siz	e 4 Coas	al Plain s	streams and Tidal Marsh Streams)
	11a.	⊠Yes	□No	ls assess	sment read	ch in a na	tural sand-bed s	stream? (s	kip for C	oastal Plain streams)
	11b.	Bedform □A			k the appr		oox(es).			
		⊟B			(evaluate ∩ (evaluate					
		⊠c	Natural	bedform	absent (sk	ip to Met	ric 12, Aquatic	Life)		
		at least	one box	in each r	ow (skip f	for Size 4	Coastal Plain	streams a	and Tidal	essment reach – whether or not submerged. Check Marsh Streams) . Not Present (NP) = absent, Rare Predominant (P) = > 70%. Cumulative percentages
	should not exceed 100% for each assessment reach.									
		NP	R	C	A	P	Bedrock/sapro	olite		
							Boulder (256	– 4096 mr	n)	
		H	H	H	\mathbb{H}	H	Cobble (64 – 2 Gravel (2 – 64			
							Sand (.062 - :	2 mm)		
		H	H		H	H	Silt/clay (< 0.0 Detritus	062 mm)		
							Artificial (rip-ra	ap, concre	te, etc.)	
	11d.	□Yes	□No	Are pool	s filled with	n sedimen	nt? (skip for Siz	e 4 Coas	al Plain s	streams and Tidal Marsh Streams)

12.	-	Aquatic Life – assessment reach metric (skip for Tidal Marsh Streams)						
	12a. ⊠ If I	_	No Was an in-stream aquatic life assessment performed as described in the User Manual? one of the following reasons and skip to Metric 13. ☐No Water ☐Other:					
	12b. 🗌	Yes ⊠	No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.					
	1		Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams. Adult frogs Aquatic reptiles					
			Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats)					
			Beetles Caddisfly larvae (T)					
			Asian clam (<i>Corbicula</i>) Crustacean (isopod/amphipod/crayfish/shrimp)					
	ğ		Damselfly and dragonfly larvae					
			Dipterans Mayfly larvae (E)					
			Megaloptera (alderfly, fishfly, dobsonfly larvae) Midges/mosquito larvae					
			Mosquito fish (Gambusia) or mud minnows (Umbra pygmaea)					
			Mussels/Clams (not <i>Corbicula</i>) Other fish					
			Salamanders/tadpoles Snails					
	ij		Stonefly larvae (P)					
			Tipulid larvae Worms/leeches					
13.		r for the	Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types) Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff.					
	$\square A$	RB □A	Little or no alteration to water storage capacity over a majority of the streamside area					
	□B ⊠C	∐в ⊠С	Moderate alteration to water storage capacity over a majority of the streamside area Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction, livestock disturbance, buildings, man-made levees, drainage pipes)					
14.			Water Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Left Bank (LB) and the Right Bank (RB) of the streamside area.					
	□A □B ⊠C	□A □B ⊠C	Majority of streamside area with depressions able to pond water ≥ 6 inches deep Majority of streamside area with depressions able to pond water 3 to 6 inches deep Majority of streamside area with depressions able to pond water < 3 inches deep					
15.	Conside wetted p	r for the	te – streamside area metric (skip for Tidal Marsh Streams) Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the normal of assessment reach.					
	□Y ⊠N	□Y ⊠N	Are wetlands present in the streamside area?					
16.			outors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams)					
	$\square A$	Streams	outors within the assessment reach or within view of <u>and</u> draining to the assessment reach. and/or springs (jurisdictional discharges)					
	□B □C		nclude wet detention basins; do not include sediment basins or dry detention basins) ion passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir)					
	⊠D ⊠E	Evidend	e of bank seepage or sweating (iron in water indicates seepage) ped or bank soil reduced (dig through deposited sediment if present)					
	□F		the above					
17.			tors – assessment area metric (skip for Tidal Marsh Streams)					
	Check a ☐A	Evidend	e of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation)					
	□B □C		ion not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit) tream (≥ 24% impervious surface for watershed)					
	⊠D ⊠E		e that the streamside area has been modified resulting in accelerated drainage into the assessment reach nent reach relocated to valley edge					
	□F		the above					
18.			sment reach metric (skip for Tidal Marsh Streams)					
	$\square A$	Stream	Consider "leaf-on" condition. shading is appropriate for stream category (may include gaps associated with natural processes)					
	□в ⊠С		ed (example: scattered trees) shading is gone or largely absent					

19.	Buffer Width – streamside area metric (skip for Tidal Marsh Streams) Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out to the first break. Vegetated Wooded LB RB LB RB A A A A A A A A A A A A A A A A A A A						
20.	Buffer Structure – streamside area metric (skip for Tidal Marsh Streams) Consider for left bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width). LB RB A Mature forest B Non-mature woody vegetation or modified vegetation structure C C Herbaceous vegetation with or without a strip of trees < 10 feet wide D D Maintained shrubs E Little or no vegetation						
21.	Buffer Stressors – streamside area metric (skip for Tidal Marsh Streams) Check all appropriate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is within 30 feet of stream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet). If none of the following stressors occurs on either bank, check here and skip to Metric 22: Abuts < 30 feet 30-50 feet LB RB LB RB A A A A A A A A A A A A A A A A A A A						
22.	Stem Density – streamside area metric (skip for Tidal Marsh Streams) Consider for left bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width). LB RB A A Medium to high stem density B B B Low stem density C C No wooded riparian buffer or predominantly herbaceous species or bare ground						
23.	Continuity of Vegetated Buffer – streamside area metric (skip for Tidal Marsh Streams) Consider whether vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide. LB RB A The total length of buffer breaks is < 25 percent. B B B The total length of buffer breaks is between 25 and 50 percent. C C The total length of buffer breaks is > 50 percent.						
24.	Vegetative Composition – streamside area metric (skip for Tidal Marsh Streams) Evaluate the dominant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to assessment reach habitat. LB RB A Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species, with non-native invasive species absent or sparse. B B B Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or communities with non-native invasive species present, but not dominant, over a large portion of the expected strata or communities missing understory but retaining canopy trees.						
	□ Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent or communities with non-native invasive species dominant over a large portion of expected strata or communities composed of planted stands of non-characteristic species or communities inappropriately composed of a single species or no vegetation.						
25.	Conductivity – assessment reach metric (skip for all Coastal Plain streams) 25a.						
NI c	25b. Check the box corresponding to the conductivity measurement (units of microsiemens per centimeter). □A < 46 □B 46 to < 67 □C 67 to < 79 □D 79 to < 230 □E ≥ 230						

Roadside ditch in a natural topographic crenulation - more water than other ditches in the area. Maintained residential on LB and road shoulder on the RB.

Stream Site Name	U-5706 Stream SR	Date of Assessmen	t 1/23/19	
Stream Category	la1	Assessor Name/Organization	Smith/Axio	om
Notes of Field Asses	ssment Form (Y/N)		YES	
Presence of regulate	ory considerations (Y/N)		NO	
Additional stream inf	formation/supplementary measu	NO		
NC SAM feature typ	e (perennial, intermittent, Tidal N	Marsh Stream)	Intermitter	nt
	Function Class Rating Sumn	nary .	USACE/ All Streams	NCDWR Intermittent
	(1) Hydrology	iai y	LOW	LOW
	(2) Baseflow	_	MEDIUM	MEDIUM
	` '	_	LOW	LOW
	(2) Flood Flow			
	(3) Streamside Ar		LOW	LOW
	(4) Floodpla		LOW	LOW
		Riparian Buffer	LOW	LOW
	(4) Microtop	<u> </u>	LOW	LOW
	(3) Stream Stabilit	· —	LOW	LOW
	(4) Channe	<u> </u>	HIGH	HIGH
	` '	nt Transport	LOW	LOW
		Geomorphology	LOW	LOW
	` '	lal Zone Interaction	NA	NA
	(2) Longitudinal Tid	lal Flow	NA	NA
	(2) Tidal Marsh Str		NA	NA
	(3) Tidal Ma	rsh Channel Stability	NA	NA
	(3) Tidal Ma	rsh Stream Geomorphology	NA	NA
	(1) Water Quality	<u></u> -	LOW	LOW
	(2) Baseflow		MEDIUM	MEDIUM
	(2) Streamside Area Veg	getation	LOW	LOW
	(3) Upland Polluta	nt Filtration	LOW	LOW
	(3) Thermoregulat	ion	LOW	LOW
	(2) Indicators of Stresso	rs	NO	NO
	(2) Aquatic Life Tolerand		LOW	NA
	(2) Intertidal Zone Filtration	n	NA	NA
	(1) Habitat		LOW	LOW
	(2) In-stream Habitat		LOW	MEDIUM
	(3) Baseflow		MEDIUM	MEDIUM
	(3) Substrate		LOW	LOW
	(3) Stream Stabilit	-y	MEDIUM	MEDIUM
	(3) In-stream Hab	itat	LOW	HIGH
	(2) Stream-side Habitat		LOW	LOW
	(3) Stream-side H	abitat	LOW	LOW
	(3) Thermoregulat		LOW	LOW
	(2) Tidal Marsh In-stream		NA	NA
	(3) Flow Restriction		NA	NA
	(3) Tidal Marsh Str		NA	NA
		rsh Channel Stability	NA	NA
		rsh Stream Geomorphology	NA	NA
	(3) Tidal Marsh In-		NA	NA NA
	(2) Intertidal Zone		NA	NA

Overall

LOW

LOW