From: Denise Suits
To: Chris Seamster
Subject: Road Name Approval

**Date:** Friday, December 22, 2017 4:03:13 PM **Attachments:** DOC122217-1222017164526.pdf

#### Hey Chris,

Here are the names I approved. Please let me know which ones you will be using when you make the final decision.

Have a Merry Christmas and Happy New Year!

#### Denise

----Original Message-----

From: EOC COPIER [mailto:TOSHIBAMFP@CHATHAMNC.ORG]

Sent: Friday, December 22, 2017 4:46 PM

To: Denise Suits

Subject: Send data from MFP11302185 12/22/2017 16:45

Scanned from MFP11302185 Date:12/22/2017 16:45

Pages:1

Resolution:400x400 DPI

Do not reply to this email address.

SUBDIVISION: RYAN'S	CROSSING	
DIRECTIONS: NORTH ON U	S 15-501; TURN LEFT ON MAI MILES AND SUBDIVISION IS OI	NN'S CHAPEL ROAD; CONTIN
ROAD ON RIG	HT.	N LEFT JUST PAST TOBACCO
DEVELOPER: MANNS CHAPEL		TA ATTACKY
	T TIONE INC	MREK:
Major Development:	X Minor Develo	mante
Development with acreage of	of 10 acreage of 10 acres	hment:
		от шоте.
Proposed road names	OK to submit	DUPLICATED
LILA DRIVE		Do not Submit
EVANDER WAY	✓ -	
DELIA LANE		
-EMELIA LANE- AMELIA LANE		
LIVILLIA LAIVE AIVIELIA LAIVE		
MINTER DRIVE		×
A A TENTA CITTOR AND TOTAL OF A		
DATE SUBMITTED TO ECUBMITTED BY:		
	CHRIS SEAMSTER/MCKIM & C	REED
ATE DOADS ADDROXUED	Suits	
DATE ROADS APPROVED  ATE FINAL PLAT DECE	7: <u> 2-32-17</u>	
DATE FINAL PLAT RECE DATE GIVEN TO 911:	AVED;	
DATE CONTACT MADE Y	WTH MINTERS	
DATE CONTACT MADE V	ATTUINDINGERS:	· · · · · · · · · · · · · · · · · · ·
SURROUNDING COUNTY PERSON SPOKEN WITH		
PERSON SPOKEN WITH: 30MMENTS:	· · · · · · · · · · · · · · · · · · ·	
· :		
		T-150/00
•	ECVIS	ed 4/19/02





**Environmental Quality Department** 

P.O. Box 548 Pittsboro, NC 27312 PHONE: (919) 545-8394

Fax: (919) 542-2698 • E-mail: drew.blake@chathamnc.org • Website: www.chathamnc.org

January 2, 2018

Mr. Eric Andrews P.O. Box 1400 Pittsboro, NC 27312

Project Name: <u>Ryan's Crossing (Parcels 1777, 1780, 88505, 88506)</u>

Chatham County Planning

Application #:

2017-1982

Location: Manns Chapel Road, Chatham County

Subject Feature(s): Two (2) ephemeral streams, four (4) intermittent streams, four

(4) perennial streams, nine (9) wetlands

Date of January 2, 2018

Determination:

Explanation: The site visit was completed on January 2, 2018 by Drew Blake with Chatham County Environmental Quality and Dan McCauley of Soil & Environmental Consultants, PA, (S&EC) on four (4) properties identified as Chatham County Parcel numbers 1777, 1780, 88505, 88506 which are located within the Jordan Lake watershed. S&EC personnel completed a previous site visit which resulted in the identification of two (2) potential ephemeral stream segments, four (4) intermittent streams segments, four (4) perennial streams segments, and nine (9) potential wetlands. S&EC submitted a request to Chatham County to complete a formal review to determine if the aforementioned features would be subject to riparian buffers according to Section 304 of the Chatham County Watershed Protection Ordinance. All points of origin and stream type transitions were reviewed and agreed to in the field. All stream and wetland denotations referenced below are based on Figure 3 – Sketch Map dated 11/16/17 and completed by S&EC. Streams E and J were confirmed to be ephemeral streams and will require a 30-ft buffer proceeding landward from the top of bank on both sides of the features. Streams C, D, G, and I were confirmed to be intermittent streams and will require a 50-ft buffer proceeding landward from the top of bank on both sides of the features.

All wetland boundaries (W1-W9) flagged in the field by S&EC are to be reviewed and confirmed by the US Army Corps of Engineers (USACE). A 50-ft buffer will be required beginning at the flagged boundary and proceeding landward of any of the nine (9) flagged wetlands determined jurisdictional by the USACE. Should a USACE review result in revisions to any features reviewed by Chatham County staff on January 2, 2018, additional reviews and consultation may be required. Please provide all revised maps, sketches, and documentation to Drew Blake following the USACE site visit for inclusion in our records.





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This on-site determination shall expire five (5) years from the date of this letter. Landowners or affected parties that dispute a determination made by Chatham County, on parcels outside of the Jordan Lake watershed, may submit a request for appeal in writing to the Watershed Review Board. A request for a determination by the Watershed Review Board shall be made in accordance with Section 304 of the Chatham County Watershed Protection Ordinance. Landowners or affected parties that dispute a determination made by Chatham County, on parcels inside the Jordan Lake watershed, shall submit a request for appeal in writing to NC DWR, 401 & Buffer Permitting Unit, 1650 Mail Service Center, Raleigh, NC 27669-1650 attention of the Director of the NC Division of Water Quality.

Should this project result in any direct impacts to surface water features (i.e., crossing and/or filling streams or wetlands) additional reviews may be necessary. Additionally, a Section 404/401 Permit may be required. Any inquiries regarding Section 404/401 permitting should be directed to the Division of Water Resources (Central Office) at (919)-807-6364 and the US Army Corp of Engineers (Raleigh Regulatory Field Office) at (919)-554-4884.

Respectfully,

Drew Blake

Watershed Specialist

Enclosures: Figure 3 – Sketch Map, dated November 16, 2017

Chatham County Riparian Buffer Application Packet (submitted December 13, 2017)

cc: Steven Ball, Soil & Environmental Consultants, PA

Dan McCauley, Soil & Environmental Consultants, PA

Alex Barroso, Seali Development Corporation

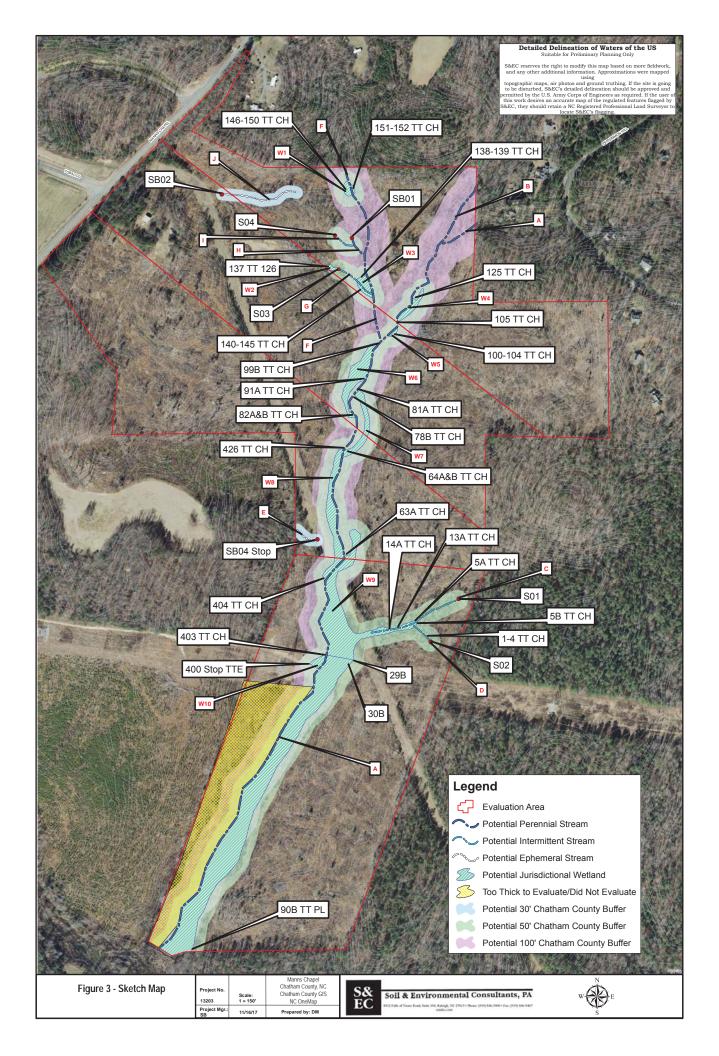
Rachael Thorn, Chatham County Watershed Protection Supervisor

Brian Burkhart, Chatham County Director of Environmental Quality

Lynn Richardson, Chatham County Subdivision Administrator Kimberly Tyson, Chatham County Land Use Administrator

Angela Birchett, Chatham County Zoning Administrator

Jason Sullivan, Chatham County Director of Planning





Watershed Protection Division Environmental Quality Department Phone: (919) 545-8394

Website: www.chathamnc.org

# Riparian Buffer Review Application Surface Water Identification Request for Major Subdivisions

Wajor Suburvisions
Application Date: 12 13 17 Planning Application Number (Office Use Only): 2017 - 1982
Tract Information
Parcel #: 00 88 506   000 1 750 Watershed District (and name of creek if known): CAPE FEAR
Property Owner: Dwight C. Ryan (WS-IV PA)
Tract Information  0088505/0001777  Parcel #: 0088 506/0001750 Watershed District (and name of creek if known): CAPE FEAR  Property Owner: Dwight C. Ryan  Location/Physical Address of Tract: 2206, 2094, 2062, 2064 Manns Chapel Road
Driving Directions from Pittsboro:
Subdivision Name (if applicable): RYAN'S CROSSING
Owner's/Agent Contact Information (Agent: Consultant, Real Estate Agent, Surveyor, Other) Circle one
Name: Eric Andrews
Contact Phone Numbers: (h)(w) 919-542-0523(c)
E-mail: Eric @ ericandrews realtur. Com
Mailing Address: P.O. Box 1400, Pittsboro, NC 27312
Do you wish to be contacted prior to Chatham County staff visiting the property?   Yes
How much notice is required prior to arrival onsite?
How would you like to receive the completed review letter? (Please check one of the following)  ☐ I would like to pick up the completed Riparian Buffer Review at the County Office
☐ I would like the completed Riparian Buffer Review mailed to me  ☑ I would like the completed Riparian Buffer Review e-mailed to me
would like the completed Riparian Burter Review c-maned to me
Please include the following items with this request
CIS consultant findings report including the following:
GIS generated or hand drawn sketch of surface water features found onsite (Buffer Plan Sheet)  No smaller than 1"=60' and paper size 11"x17" or larger
NCDWQ Stream Identification Forms, Version 4.11, Wetland Determination Data Form –
Eastern Mountains and Piedmont Region, digital photographs, notes, sketches, etc.



Land & Water Resources Division Environmental Quality Department Phone: (919) 545-8394

Website: www.chathamnc.org

#### Riparian Buffer Review Application Surface Water Identification Request

Surface water identification Request
NRCS map with property boundary depicted
☑ USGS map with property boundary depicted
☐ Statement of Credentials (Training Certificate for NCDWQ/NC State University Surface
Waters Classification course, 2 years of jurisdictional wetland delineation according to
the Eastern Mountains and Piedmont Regional Supplement to the 1987 US Corps of
Engineers Wetland Delineation Manual)
Signed Right to Enter Property Form
☑ Signed Owner's Agent Designation Form
☑ Fee (make checks payable to Chatham County) \$100 per feature confirmed onsite
Feature is defined as any surface water that is subject to Chatham County Riparian Buffers (streams,
wetlands, ponds)
Total Number of Features: Total Paid: \$_\_\00.00
I have read and understand the regulations of the Watershed Protection Ordinance, Section 304, and I agree to adhere to these associated policies and guidelines herein.
Owner/Agent Signature:
Applications can be submitted by mail to: Environmental Quality Department, P.O. Box 548, Pittsboro, NC 27312 or by electronic mail to <a href="mailto:drew.blake@chathamnc.org">drew.blake@chathamnc.org</a>
For Questions, please contact:
Drew Blake, Watershed Specialist, at (919)-545-8394 or drew.blake@chathamnc.org
Rachael Thorn, Watershed Protection Supervisor, at (919) 545-8343 or rachael.thorn@chathamnc.org



LAND & WATER RESOURCES DIVISION **Environmental Quality Department** 

PHONE: (919) 545-8204

Website: www.chathamnc.org

#### AUTHORIZED AGENT FOR LEGAL REPRESENTATION FORM

	PROPERTY LEGAL DESCRIPTION: 0088505/0001777
	PROPERTY LEGAL DESCRIPTION: 0088505/0001777  LOT NO. 1-4 PARCEL ID (PIN) PARCEL SIZE 127.13 ACRES
	STREET ADDRESS: 2206, 2094, 2062, 2064 MANNS CHAPEL ROAD
	Please print: Property Owner: KATHLEEN RYAN
	Property Owner:
	The undersigned, owner(s) of the above described property, do hereby authorize
	STEVEN BALL OF SOIL ENVIRONMENTAL CONSULTANTS P.A. (Contractor/Agent) (Name of consulting firm if applicable)
	(Contractor/Agent) (Name of consulting firm if applicable)
	to act on my/our behalf and take all actions, I/we could have taken if present, necessary for the processing, issuance and acceptance of reviews, inspections, or permits and any and all standard and special conditions attached to these approvals. The activities authorized include the following (initial all that apply):
FX	Zoning Compliance Permits  Floodplain Determination
14 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Soil Erosion and Sedimentation Control Permit
FX.	Permits to install, repair, evaluate, or expand onsite wastewater system(s)  Evaluation/inspection/permitting of a private drinking water well(s)
	Riparian Buffer Review pursuant to §304 of the Chatham County Watershed Protection Ordinance Other:
	Property Owner's Address (if different than property above):
	3350 HWY. 63 RISON, AR 71665
	Owner Telephone: (870) 357-2058 Email:
	We hereby certify the above information submitted in this application is true and accurate to the best of our knowledge.
	Kallium Kyan Owner Authorized Signature Agent Authorized Signature
	Date: Date:
	Applications can be mailed to: Planning Dept., PO Box 54, Pittsboro, NO 27312
	F. O. W

For Questions, please contact: Lynn Richardson at 919-542-8207

Revised 3/2014

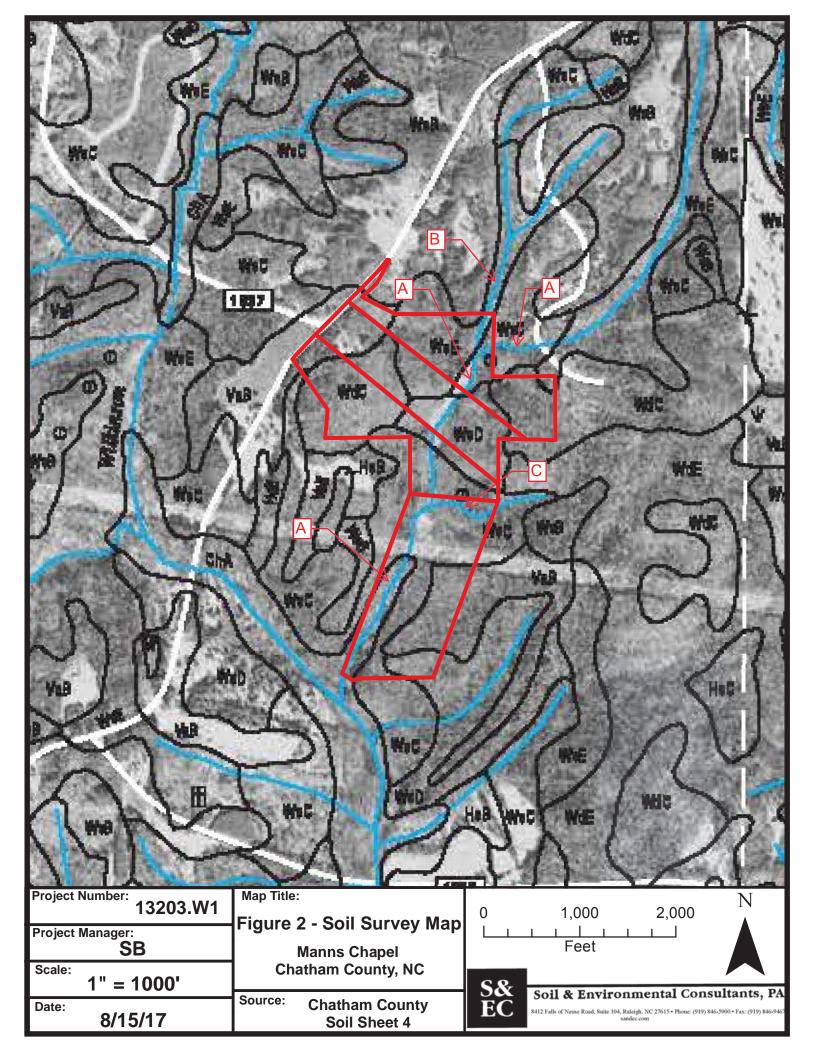


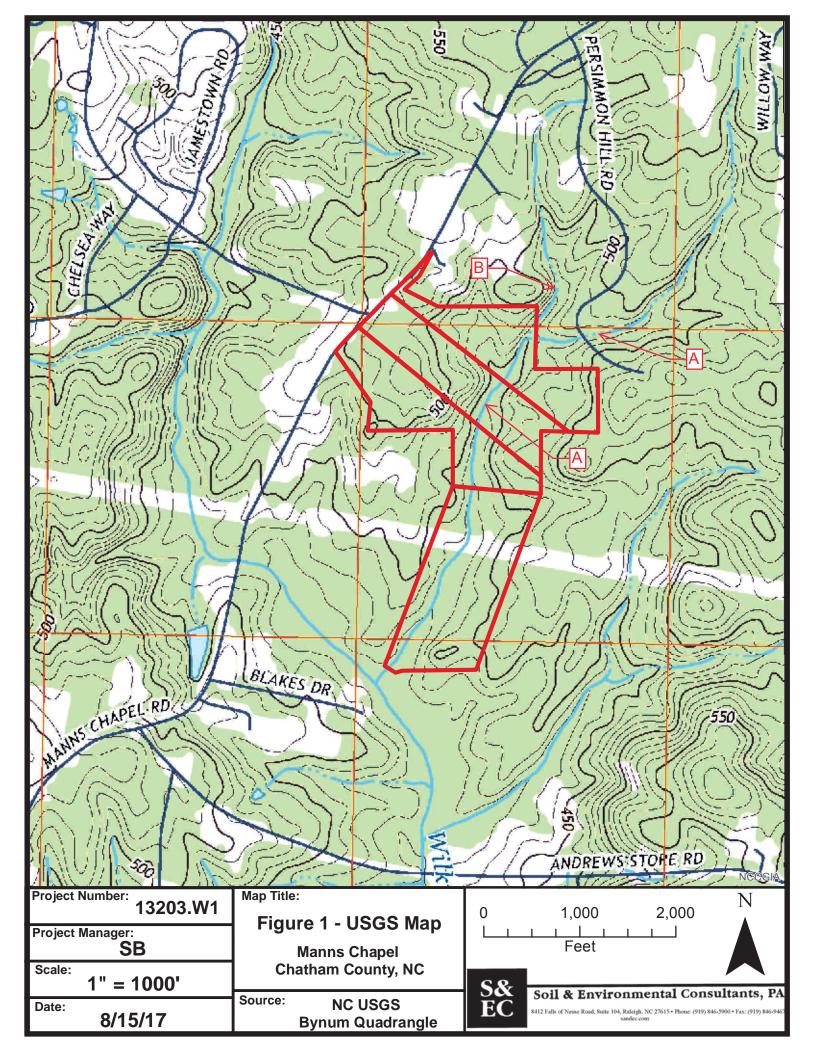
LAND & WATER RESOURCES DIVISION Environmental Quality Department

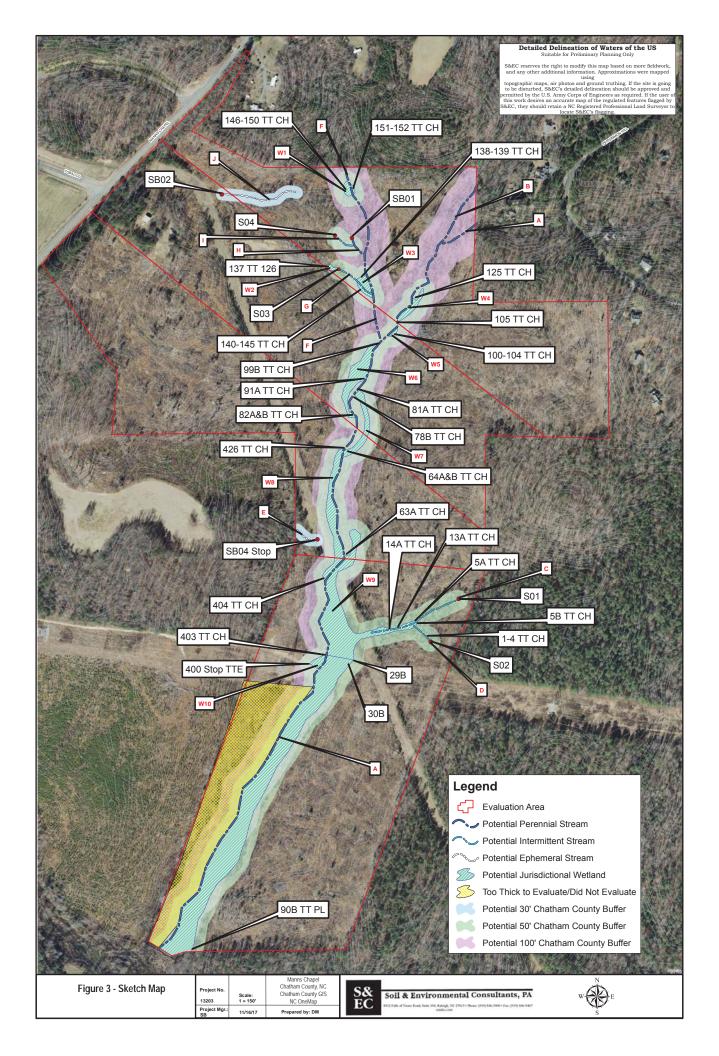
PHONE: (919) 545-8394

Website: www.chathamnc.org

Authoriz	ation to Enter Property I	Form
Date: 11/28/17		
PARCEL No. (AKPAR) 008950	05/0001777/0088506/00	OBTIO
I, (print name) KATHLEN R	MAY	, as owner of the property
described above, or as a representati	ve of the owner(s) do hereby convey p	permission to Chatham County
	nvenience to conduct a surface water	
	ot water features on my property are s	
regulations described in Section 304	of the Chatham County Watershed Pro	tection Ordinance. The SWID
will be public record and on file at the	e Planning and Environmental Quality [	Departments, and may be
requested in the future for review by		
I understand that stream delineations	for the property listed above will be m	nade by County staff only
once and that if future subdivisions ar	e proposed within this property bound	ary, it will require a surface
water identification by a private consu	ıltant at the property owner's expense.	
ATHLEEN RYAN	Eathleen Kyan	12/6/2017
(Print Owner's Name)	(Sightture of Owner)	(Date)
(Print Authorized Agent Name)	(Signature of Authorized Agent)	(Date)







Date:   / 4/17	Project/Site: Manns Chare		Latitude: 35.83/842	
Evaluator: S&EC - Steven Ball	County: Chat	ham	Longitude: -	79.134586
Total Points: Stream is at least intermittent if $\geq 19$ or perennial if $\geq 30^*$ 39.5	Stream Determin	nation (circle one) mittent (Perennia)	Other e.g. Quad Name:	Вулим
A. Geomorphology (Subtotal = 22)	Absent	Weak	Moderate	Strong
1ª. Continuity of channel bed and bank	0	1	2	3
Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool,	0	1	2	3
ripple-pool sequence 4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1		3
6. Depositional bars or benches	0	1	0	3
Recent alluvial deposits	0	1	0	3
Recent alluvial deposits     Headcuts	0	1	2	3
9. Grade control		0.5		1.5
10. Natural valley	0	0.5	Ø ①	1.5
11. Second or greater order channel	No		Yes =	135,000,00
a artificial ditches are not rated; see discussions in manual	110		100	
B. Hydrology (Subtotal = 10.5)				
12. Presence of Baseflow	0	1	2	<b>③</b>
13. Iron oxidizing bacteria	0	0	2	3
14. Leaf litter	(1.5)	1	0.5	0
15. Sediment on plants or debris	0	0.5	0)	1.5
16. Organic debris lines or piles	0	0.5	<u>(1)</u>	1.5
17. Soil-based evidence of high water table?	No:	= 0	Yes =	3)
C. Biology (Subtotal = 7			- 3504.50	
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	<b>Ø</b>	2 .	1	0
20. Macrobenthos (note diversity and abundance)	8	1	2	3
21. Aquatic Mollusks	Ø	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
		FACW = 0.75; OBL	= 1.5 Other = (7	
26. Wetland plants in streambed				
26. Wetland plants in streambed *perennial streams may also be identified using other methods	s. See p. 35 of manual.		1300	

NC DWQ Stream Identification For	m Version 4.1				
Date:   / 4/17	Project/Site: Ma	anns Chapel	Latitude: 35.852758  Longitude: -79.134113		
Evaluator: S&EC-Steven Ball	County: Chat	ham			
Total Points: Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*			Other e.g. Quad Name:	Вупим	
115					
A. Geomorphology (Subtotal = 16.5)	Absent	Weak	Moderate	Strong	
T Continuity of Charmer bed and bank	0	1	② ②	3	
2. Sinuosity of channel along thalweg	0	1	(2)	3	
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3	
Particle size of stream substrate	0	1	Ø	3	
Active/relict floodplain	0	0	2	3	
Depositional bars or benches	0	1	<b>D</b>	3	
7. Recent alluvial deposits	0	0	2	3	
Necent anuvial deposits     Headcuts	ő	<u> </u>	2	3	
9. Grade control	0	0.5	1		
10. Natural valley	0			1.5	
11. Second or greater order channel	No	0.5	① 1.5		
artificial ditches are not rated; see discussions in manual	INO	-0	Yes 7	<u> </u>	
B. Hydrology (Subtotal = 9 )					
12. Presence of Baseflow	0	1	0	3	
Iron oxidizing bacteria      Leaf litter	0	Q .	2	3	
	1.5	0	0.5	0	
15. Sediment on plants or debris	0	0.5	0	1.5	
Organic debris lines or piles     Soil-based evidence of high water table?	0 No:	0.5		1.5	
	NO:	- 0	Yes =	<u> </u>	
C. Biology (Subtotal =					
18. Fibrous roots in streambed	(3)	2	1	0	
19. Rooted upland plants in streambed	(3)	2 ,	1	0	
20. Macrobenthos (note diversity and abundance)	Ø	1	2	3	
21. Aquatic Mollusks	0	1	2	3	
22. Fish	8	0.5	1	1.5	
23. Crayfish	0	0.9	1	1.5	
24. Amphibians	0	0.3	1	1.5	
25. Algae	0 0.5 1 1				
26. Wetland plants in streambed		FACW = 0.75; OBL =	= 1.5 Other <b>=</b> 0	)	
*perennial streams may also be identified using other method	is. See p. 35 of manual.				
Notes:		The state of the s			
			4		
Ckatah					
Sketch:					

Date:   / 4/ 7	Project/Site: Manns Chape		Latitude: 35.827407		
Evaluator: S&EC-Steven Ball	County: Chat	ham	Longitude: -	79.134455	
Total Points:  Stream is at least intermittent 27.5  if ≥ 19 or perennial if ≥ 30*		nation (circle one) mitten Perennial	Other e.g. Quad Name:	Вупим	
A. Geomorphology (Subtotal = 14.5	Absent	Weak	Moderate	Strong	
1ª. Continuity of channel bed and bank	0	1	2	3	
2. Sinuosity of channel along thalweg	0	0	2	3	
3. In-channel structure: ex. riffle-pool, step-pool,			0		
ripple-pool sequence	0	1		3	
4. Particle size of stream substrate	0	1	2	3	
5. Active/relict floodplain	0	1	2	3	
6. Depositional bars or benches	0	Q	2	3	
7. Recent alluvial deposits	0	8	2	3	
3. Headcuts	0	0	2	3	
9. Grade control	0	0.5	1	1.5	
10. Natural valley	0	0.5	0	1.5	
11. Second or greater order channel	No	= 0	Yes = (3)		
artificial ditches are not rated; see discussions in manual					
B. Hydrology (Subtotal =)			322		
12. Presence of Baseflow	0	(1)	2	3	
13. Iron oxidizing bacteria	0	1	0	3	
14. Leaf litter	1.5	(1)	0.5	0	
15. Sediment on plants or debris	0	(0,8)	1	1.5	
16. Organic debris lines or piles	0	(0.5)	1	1.5	
17. Soil-based evidence of high water table?	No:		Yes 7	-	
C. Biology (Subtotal = <b>\$</b> )					
18. Fibrous roots in streambed	3	2	0	0	
9. Rooted upland plants in streambed	3	(2)	1	0	
20. Macrobenthos (note diversity and abundance)	0	1	2	3	
21. Aquatic Mollusks	0	1	2	3	
22. Fish	O	0.5	1	1.5	
23. Crayfish	6	0.5	1	1.5	
24. Amphibians	0	(0.5)	1	1.5	
25. Algae	6)	0.5	1	1.5	
26. Wetland plants in streambed		FACW = 0.75; OBL	=(1.5) Other = 0		
*perennial streams may also be identified using other method	ds. See p. 35 of manual.	17.077 0.10, 002	0		
Notes:			- acc		
Sketch:					
				1	

Date:   / 4/17	Project/Site: Ma	Project/Site: Manns Chape		.826942
Evaluator: S&EC-Steven Ball	County: Chat	ham		79.134648
Total Points:  Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determi Ephemeral Inte	nation (circle one) rmittent Perennial	Other e.g. Quad Name:	Вупим
A. Geomorphology (Subtotal =)	Absent	Weak	Moderate	Strong
1ª Continuity of channel bed and bank	0	1	②	3
2. Sinuosity of channel along thalweg	0	0	2	3
3. In-channel structure: ex. riffle-pool, step-pool,	0			
ripple-pool sequence	. 0	1	2	3
4. Particle size of stream substrate	0	1	@	3
5. Active/relict floodplain	Ø	1	2	3
6. Depositional bars or benches	0	0	2	3
7. Recent alluvial deposits	0	0	2	3
3. Headcuts	0	Ġ	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	0	1.5
Second or greater order channel	No =(0) Yes = 3			3
artificial ditches are not rated; see discussions in manual				
3. Hydrology (Subtotal =)				
2. Presence of Baseflow	0	1	(2)	3
3. Iron oxidizing bacteria	0	1	<b>Ø</b>	3
4. Leaf litter	1.5	(1)	0.5	0
5. Sediment on plants or debris	0	0.5	1	1.5
6. Organic debris lines or piles	0	(0.5)	1	1.5
7. Soil-based evidence of high water table?	No	=0	Yes =	
C. Biology (Subtotal = 3.5 )				
8. Fibrous roots in streambed	3	2	(1)	0
Rooted upland plants in streambed	3	(2)	1	0
0. Macrobenthos (note diversity and abundance)	0	1	2	3
1. Aquatic Mollusks	0	1	2	3
2. Fish	(6)	0.5	1	1.5
3. Crayfish	6	0.5	1	1.5
4. Amphibians	0	(0.5)	1	1.5
5. Algae	0	0.5	1	1.5
6. Wetland plants in streambed		FACW = 0.75; OBL	= 1.5 Other = 0	
*perennial streams may also be identified using other method	s. See p. 35 of manual.			-
Notes:				
ketch:				

Evaluator: S&EC - Steven Ball  Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*  A. Geomorphology (Subtotal = 5.5)  Absent Weak Mood 1	Pate:   / 4/ 7			Latitude: 35.828277 Longitude: -79.136460		
A. Geomorphology (Subtotal = 5.5   Absent   Weak   Moo   1   2.5   Mosent   Moo   1   2.5   Moo   Moo   1   2.5   Moo   Moo   2.5   Moo   Moo   1   2.5   Moo						
2. Sinuosity of channel along thalweg 3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence 4. Particle size of stream substrate 5. Active/relict floodplain 6. Depositional bars or benches 7. Recent alluvial deposits 8. Headcuts 9. Grade control 10. Natural valley 11. Second or greater order channel 8 Hydrology (Subtotal = 2) 12. Presence of Baseflow 13. Iron oxidizing bacteria 14. Leaf litter 15. Sediment on plants or debris 16. Organic debris lines or piles 17. Soil-based evidence of high water table? 18. Fibrous roots in streambed 20. Macrobenthos (note diversity and abundance) 21. Aquatic Mollusks 22. Fish 24. Amphibians	tream is at least intermittent			Other e.g. Quad Name:	Вулим	
Contribution of channel along thalweg	Geomorphology (Subtotal = 5.5	Absent	Weak	Moderate	Strong	
2. Sinuosity of channel along thalweg 3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence 4. Particle size of stream substrate 5. Active/relict floodplain 6. Depositional bars or benches 7. Recent alluvial deposits 8. Headcuts 9. Grade control 10. Natural valley 11. Second or greater order channel 8. Hydrology (Subtotal = 2 ) 12. Presence of Baseflow 13. Iron oxidizing bacteria 14. Leaf litter 15. Sediment on plants or debris 16. Organic debris lines or piles 17. Soil-based evidence of high water table? 18. Fibrous roots in streambed 19. Rooted upland plants in streambed 20. Macrobenthos (note diversity and abundance) 21. Aquatic Mollusks 22. Fish 23. Crayfish 24. Amphibians	a Continuity of channel hed and hank			2	3	
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	The second secon			2	3	
Particle size of stream substrate						
5. Active/relict floodplain 6. Depositional bars or benches 7. Recent alluvial deposits 8. Headcuts 9. Grade control 10. Natural valley 11. Second or greater order channel 12. Presence of Baseflow 13. Iron oxidizing bacteria 14. Leaf litter 15. Sediment on plants or debris 16. Organic debris lines or piles 17. Soil-based evidence of high water table? 18. Fibrous roots in streambed 19. Rooted upland plants in streambed 20. Macrobenthos (note diversity and abundance) 21. Crayfish 22. Fish 23. Crayfish 24. Amphibians 25. Sediment on plants 26. Organic delaris instreambed 27. Soil-based evidence of high water table? 28. Fish 29. O. 5. Sediment on plants on the streambed 30. O. 5. Sediment on the streambed on	ripple-pool sequence			2	3	
7. Recent alluvial deposits  8. Headcuts  9. Grade control  10. Natural valley  11. Second or greater order channel  12. Presence of Baseflow  13. Iron oxidizing bacteria  14. Leaf litter  15. Sediment on plants or debris  16. Organic debris lines or piles  17. Soil-based evidence of high water table?  18. Fibrous roots in streambed  19. Rooted upland plants in streambed  10. Macrobenthos (note diversity and abundance)  11. Aquatic Mollusks  12. Fish  13. Crayfish  14. Amphibians	Particle size of stream substrate		0	2	3	
7. Recent alluvial deposits  8. Headcuts  9. Grade control  10. Natural valley  11. Second or greater order channel  12. Presence of Baseflow  13. Iron oxidizing bacteria  14. Leaf litter  15. Sediment on plants or debris  16. Organic debris lines or piles  17. Soil-based evidence of high water table?  18. Fibrous roots in streambed  19. Rooted upland plants in streambed  10. Macrobenthos (note diversity and abundance)  11. Aquatic Mollusks  12. Fish  13. Crayfish  14. Amphibians	Active/relict floodplain	(6)	1	2	3	
1	Depositional bars or benches	0		2	3	
9. Grade control	Recent alluvial deposits		0	2	3	
10. Natural valley 11. Second or greater order channel 12. Hydrology (Subtotal = 2 ) 12. Presence of Baseflow 13. Iron oxidizing bacteria 14. Leaf litter 15. Sediment on plants or debris 16. Organic debris lines or piles 17. Soil-based evidence of high water table? 18. Fibrous roots in streambed 19. Rooted upland plants in streambed 20. Macrobenthos (note diversity and abundance) 21. Aquatic Mollusks 22. Fish 23. Crayfish 24. Amphibians	Headcuts		1	2	3	
11. Second or greater order channel	Grade control ·	0	0.5	1	1.5	
Bartificial ditches are not rated; see discussions in manual   Bartificial ditches are not rated; see discussions in manual   Bartificial ditches are not rated; see discussions in manual   Bartificial ditches   Bartificial	). Natural valley	0	0.5	1	1.5	
B. Hydrology (Subtotal = 2 )		No	=®	Yes = 3		
12. Presence of Baseflow  13. Iron oxidizing bacteria  14. Leaf litter  15. Sediment on plants or debris  16. Organic debris lines or piles  17. Soil-based evidence of high water table?  18. Fibrous roots in streambed  19. Rooted upland plants in streambed  20. Macrobenthos (note diversity and abundance)  21. Aquatic Mollusks  22. Fish  23. Crayfish  24. Amphibians		E4				
3. Iron oxidizing bacteria	. Hydrology (Subtotal =2)					
13. Iron oxidizing bacteria  14. Leaf litter  15. Sediment on plants or debris  16. Organic debris lines or piles  17. Soil-based evidence of high water table?  18. Fibrous roots in streambed  19. Rooted upland plants in streambed  20. Macrobenthos (note diversity and abundance)  21. Aquatic Mollusks  22. Fish  23. Crayfish  24. Amphibians	Presence of Baseflow	0	1	2	3	
14. Leaf litter       1.5       0         15. Sediment on plants or debris       0       0.5         16. Organic debris lines or piles       0       0.5         17. Soil-based evidence of high water table?       No • ①         18. Fibrous roots in streambed       3       2         19. Rooted upland plants in streambed       3       2         20. Macrobenthos (note diversity and abundance)       0       1         21. Aquatic Mollusks       0       1         22. Fish       0       0.5         23. Crayfish       0       0.5         24. Amphibians       0       0.5	Iron oxidizing bacteria		1	2	3	
5. Sediment on plants or debris   0   0.5   16. Organic debris lines or piles   0   0.5   17. Soil-based evidence of high water table?   No = 0   0.5   17. Soil-based evidence of high water table?   No = 0   0.5   17. Soil-based evidence of high water table?   No = 0   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5				0.5	0	
16. Organic debris lines or piles       0       0.5)         17. Soil-based evidence of high water table?       No = 0         18. Fibrous roots in streambed       3       2         19. Rooted upland plants in streambed       3       2         20. Macrobenthos (note diversity and abundance)       0       1       2         21. Aquatic Mollusks       0       0.5       1         22. Fish       0       0.5       1         23. Crayfish       0       0.5       1         24. Amphibians       0.5       1				1	1.5	
17. Soil-based evidence of high water table?       No €0         C. Biology (Subtotal =				1	1.5	
C. Biology (Subtotal = 3 )  18. Fibrous roots in streambed 3 2 (2 )  19. Rooted upland plants in streambed 3 (2 )  20. Macrobenthos (note diversity and abundance) (5 ) 1 (2 )  21. Aquatic Mollusks (6 ) 1 (2 )  22. Fish (9 ) 0.5 (2 )  23. Crayfish (9 ) 0.5 (2 )  24. Amphibians (9 ) 0.5 (1 )				Yes =		
18. Fibrous roots in streambed       3       2         19. Rooted upland plants in streambed       3       2         20. Macrobenthos (note diversity and abundance)       0       1         21. Aquatic Mollusks       0       1         22. Fish       0       0.5         23. Crayfish       0       0.5         24. Amphibians       0       0.5						
19. Rooted upland plants in streambed       3       ②         20. Macrobenthos (note diversity and abundance)       ⑤       1       2         21. Aquatic Mollusks       ⑥       1       2         22. Fish       ⑤       0.5       1         23. Crayfish       ②       0.5       1         24. Amphibians       ②       0.5       1		3	2	0	0	
20. Macrobenthos (note diversity and abundance)       ©       1       2         21. Aquatic Mollusks       ©       1       2         22. Fish       ©       0.5       1         23. Crayfish       ©       0.5       1         24. Amphibians       0.5       1	The state of the s			1	0	
21. Aquatic Mollusks     ©     1     2       12. Fish     ©     0.5     1       13. Crayfish     ©     0.5     1       14. Amphibians     Q     0.5     1				2	3	
22. Fish     Oy     0.5       23. Crayfish     O     0.5       24. Amphibians     O     0.5				2	3	
3. Crayfish 0.5 14. Amphibians 0.5 15				1	1.5	
4. Amphibians Q 0.5		18		1	1.5	
		(4		1	1.5	
0.5	The second secon	1 8		1	1.5	
6. Wetland plants in streambed FACW = 0.75; OBL = 1.5				= 1.5 Other = 0	1.5	
*perennial streams may also be identified using other methods. See p. 35 of manual.		See n 35 of manual	1 AOV - 0.75, OBL	- 1.5 Other - 0		
Notes:	The second secon	. See p. 55 of manual.				
10165.	NAS.					

NC DWQ Stream Identification Form Version 4.1 Latitude: 35, 832800 Project/Site: Manns Charel Date: Evaluator: S&EC - Steven Ball County: ( hatham Longitude: -79.135729 **Total Points:** Stream Determination (circle one) Stream is at least intermittent e.g. Quad Name: Bynum Ephemeral Intermittent (Perennial) if ≥ 19 or perennial if ≥ 30\* Strong A. Geomorphology (Subtotal = Absent Weak Moderate 1a. Continuity of channel bed and bank (3) 0 1 0 2. Sinuosity of channel along thalweg 0 1 3 3. In-channel structure: ex. riffle-pool, step-pool, 0 0 1 3 ripple-pool sequence (2)4. Particle size of stream substrate 3 0 1 0 3 5. Active/relict floodplain 0 0 6. Depositional bars or benches 0 3 0 3 7. Recent alluvial deposits 0 2 0 2 3 8. Headcuts 05 1 1.5 9. Grade control 0 0.5 1 1.5 10. Natural valley 0 No = 011. Second or greater order channel Yes = (3) a artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = (2) 12. Presence of Baseflow 0 3 1 (1) 3 13. Iron oxidizing bacteria 0 2 (D 14. Leaf litter 1.5 0.5 0 O 1.5 15. Sediment on plants or debris 0 0.5 16. Organic debris lines or piles 0 (1) 1.5 0.5 No = 0Yes = 3 17. Soil-based evidence of high water table? C. Biology (Subtotal = 18. Fibrous roots in streambed 2 1 0 3 0 19. Rooted upland plants in streambed 2 1 0 3 20. Macrobenthos (note diversity and abundance) 1 2 0 21. Aquatic Mollusks 1 2 3 0 22. Fish 0.5 1 1.5 23. Crayfish 6.5 1.5 0 1 0 6.5 1 1.5 24. Amphibians 0 1.5 25. Algae 0.5 FACW = 0.75; OBL = 1.5 Other = 0 26. Wetland plants in streambed \*perennial streams may also be identified using other methods. See p. 35 of manual. Notes: Sketch:

weak  1 1 1 0 0.5 0.5 0.5	Other e.g. Quad Name:  Moderate  2 2 2 2 2 2 1 1 Yes =	79.135 903  Bynum  Strong  3  3  3  3  1.5  1.5
Weak  1 1 1 1 0 0.5 0.5 0.5	Other e.g. Quad Name:  Moderate  2 2 2 2 2 2 1 1 Yes =	Strong  3 3 3 3 3 3 1.5 1.5
Weak  (1)  (1)  (1)  (1)  (1)  (1)  (0)  (0.5)  (0.5)	e.g. Quad Name:  Moderate  2 2 2 2 2 2 1 1 Yes =	Strong  3 3 3 3 3 3 3 1.5 1.5 1.5
① 1 1 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2 2 2 2 2 2 2 2 1 1 1 Yes =	3 3 3 3 3 3 3 3 1.5 1.5
① 1 1 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2 2 2 2 2 2 2 2 1 1 1 Yes =	3 3 3 3 3 3 3 3 1.5 1.5
1 1 0 0 0 0 0 0.5 0.5	2 2 2 2 2 2 1 1 1 Yes =	3 3 3 3 3 3 1.5 1.5
1 1 0 0 0 0 0.5 0.5	2 2 2 2 2 2 1 1 1 Yes =	3 3 3 3 3 1.5 1.5
① ① ① ① 0.5 (0.5)	2 2 2 2 2 1 1 1 Yes =	3 3 3 1.5 1.5 = 3
(1) (1) (0,5) (0,5) (0,5)	2 2 2 2 1 1 1 Yes =	3 3 3 1.5 1.5 = 3
(1) (1) (0,5) (0,5) (0,5)	2 2 2 1 1 Yes =	3 3 1.5 1.5 = 3
0 0 0.5 0.5 0.5	2 2 1 1 Yes =	3 3 1.5 1.5 = 3
0.5 0.5 0.5	2 1 1 Yes =	3 1.5 1.5 = 3
0.5 (0.5)	1 1 Yes =	1.5 1.5 = 3
(0.5) (0.5)	1 Yes =	1.5
<b>⊘</b>	Yes =	3
<u> </u>	2 2	3
1	2	
1	2	
1	2	
		- 2
( )		0
	0.5	1.5
0.5	<b>3</b>	1.5
0.5	Yes 7	
	103 ]	9
0	1	0
2	1	0
1	2	3
		3
		1.5
		1.5
		1.5
		1.5
		1.5
	L = 1.5 Other Fo	
	1 0.5 0.5 0.5 0.5	1 2 0.5 1 0.5 1 0.5 1 0.5 1 FACW = 0.75; OBL = 1.5 Other = 0

NC DWQ Stream Identification Form Version 4.1 Latitude: 35.832184 Project/Site: Manns Charel Date: Longitude: -79.135781 Evaluator: S&EC - Steven Ball County: ( hatham **Total Points:** Stream Determination (circle one) Other Stream is at least intermittent Ephemeral Intermittent Perennia e.g. Quad Name: Bynum if ≥ 19 or perennial if ≥ 30\* A. Geomorphology (Subtotal = 14.5 Absent Weak Moderate Strong 1<sup>a.</sup> Continuity of channel bed and bank 0 (2) 3 2. Sinuosity of channel along thalweg 0 (1) 3 2 3. In-channel structure: ex. riffle-pool, step-pool, (1) 0 2 3 ripple-pool sequence 4. Particle size of stream substrate 0 0 1 3 5. Active/relict floodplain 0 3 1 2 0 6. Depositional bars or benches 0 2 3 7. Recent alluvial deposits 0 ① 2 3 8. Headcuts (2) 0 3 9. Grade control (0.5) 0 1.5 (1) 10. Natural valley 0 0.5 1.5 11. Second or greater order channel No = 0Yes =(3) artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = 0 12. Presence of Baseflow 0 1 3 6 13. Iron oxidizing bacteria 2 3 1 O 14. Leaf litter 1.5 0.5 0 15. Sediment on plants or debris 0 0.5 0 1.5 16. Organic debris lines or piles 10 0 0.5 1.5 17. Soil-based evidence of high water table? No = 0Yes = 3 C. Biology (Subtotal = **3**3 18. Fibrous roots in streambed 2 0 19. Rooted upland plants in streambed 2 0 20. Macrobenthos (note diversity and abundance) (1) 2 3 0 21. Aquatic Mollusks 0 2 3 1 22. Fish 0 0.5 1 1.5 23. Crayfish 0 0.5 1.5 1 24. Amphibians 1 0 0.5 1.5 25. Algae 0 1.5 26. Wetland plants in streambed FACW = 0.75; OBL = 1.5 Other = 0 \*perennial streams may also be identified using other methods. See p. 35 of manual. Notes: Sketch:

NC DWQ Stream Identification Form	m Version 4.1		-		
Date:   / 4/17	Project/Site: Manns Chape   Latitu		Latitude: 35	.832227	
Evaluator: S&EC - Steven Ball	County: (hat	ham	Longitude: -	79.136009	
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determine Ephemeral (Inte	nation (circle one) rmittent Perennial	Other e.g. Quad Name:		
A. Geomorphology (Subtotal = 10)	Absent	Weak	Moderate	Strong	
1ª. Continuity of channel bed and bank	0	1	(Z)	3	
2. Sinuosity of channel along thalweg	0	0	2	3	
3. In-channel structure: ex. riffle-pool, step-pool,					
ripple-pool sequence	0	1	2	3	
Particle size of stream substrate	0	Ø	2	3	
5. Active/relict floodplain	0	1	2 -	3	
Depositional bars or benches	0	0	2	3	
7. Recent alluvial deposits	0	<b>0</b>	2	3	
8. Headcuts	0	1	2	3	
9. Grade control	0	0.5	1	1.5	
10. Natural valley	0	0.5	0	1.5	
11. Second or greater order channel	No	=(0)	Yes =	: 3	
artificial ditches are not rated; see discussions in manual					
B. Hydrology (Subtotal =)					
12. Presence of Baseflow	0	0	2	3	
13. Iron oxidizing bacteria	0	1	2	3	
14. Leaf litter	1.5	0	0.5	0	
15. Sediment on plants or debris	0	0.9	1	1.5	
16. Organic debris lines or piles	0	(0.3)	1	1.5	
17. Soil-based evidence of high water table?	No:		Yes =		
C. Biology (Subtotal = 5 )			100	9	
18. Fibrous roots in streambed	3	0	1	0	
19. Rooted upland plants in streambed		2	1	0	
20. Macrobenthos (note diversity and abundance)	8	1	2	3	
21. Aquatic Mollusks	0	1	2	3	
22. Fish	ő	0.5	1	1.5	
23. Crayfish	0	0.5	1	1.5	
24. Amphibians	6	0.5	1	1.5	
25. Algae	0	0.5	1	1.5	
26. Wetland plants in streambed		FACW = 0.75; OBL		1.5	
*perennial streams may also be identified using other method:	s See n 35 of manual	17,000 - 0.75, OBL	- 1.5 Other - 0		
Notes:	o. oco p. oo or mandar.				
			- 22		
Sketch:				i	
				la de la companya de	

Date:   / 4//7	Project/Site: Manns Chape    County: Chatham  Stream Determination (circle one) Ephemeral Intermittent Perennial		Latitude: 35.832798  Longitude: -79.137504  Other e.g. Quad Name: Bynum	
Evaluator: S&EC - Steven Ball				
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*				
A. Geomorphology (Subtotal = 5.5)	Absent	Weak	Moderate	Ctuona
1ª. Continuity of channel bed and bank	O	Ø .	2	Strong
Sinuosity of channel along thalweg	0	0	2	3
In-channel structure: ex. riffle-pool, step-pool,				
ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	G/	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	0	①	2	3
8. Headcuts	0	0	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	(0.5)	1	1.5
11. Second or greater order channel	No		Yes = 3	
artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 1.5)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	0	0.5	0
15. Sediment on plants or debris	6	0.5	1	1.5
16. Organic debris lines or piles	0	0.3	1	1.5
17. Soil-based evidence of high water table?	No:		Yes = 3	
C. Biology (Subtotal = 4 )	1	0	100	
18. Fibrous roots in streambed	3	a	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	Ŏ	1	2	3
21. Aquatic Mollusks		1	2	3
22. Fish	8	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	6	0.5	1	
25. Algae	6/	0.5	1	1.5 1.5
20. Algae		FACW = 0.75; OBL	-15 Othor 0	1.5
26 Wetland plants in streamhed	-1	FACVV - 0.75, OBL	- 1.5 Other -(0)	
26. Wetland plants in streambed				
26. Wetland plants in streambed *perennial streams may also be identified using other method Notes:				