Open Waterbody Data Sheet

| Open waterboo | iy Dala Sileel | | | | | | |
|--|--------------------------------|-------------------------|-----------------------------|--------------------------|---------------------------------|------------------------------------|----|
| Survey Descripti | on | | | | | | |
| Project Name: | | Waterbody N | Name: | | Waterbody ID: | Date: | |
| Atlantic Coast Pip | eline | Mush Islan | nd Gut | | OHLC001 | 11/19/2014 | |
| State: | County: | | Company: | Crew | / Member Initials: | Photos: | |
| North Carolina | Halifax | | NRG | CR, | AS | OHLC001_001-003 | |
| Tract Number(s): | • | | Nearest Milepost: | • | Associated Wetland | ID(s): | |
| 17-004 | | | 306.5 | | None | | |
| Survey Type: (check one) | □Centerlin | e ⊠R | Re-Route | □Access Road | □Other: | | |
| Physical Attribut | es | | | | | | |
| Waterbody Type: (check one) ☐Stoo | ck Pond Natura | I Pond □ La | ake □ Reservoir ▷ | Impoundment [| ☐ Oxbow ☐ Other: | | |
| Hydrologic Regime: | | | 3.0 | | | | |
| | □ Permanently | | Semipermanently | Flooded ⊔ Sea | sonally Flooded | Temporarily Flooded | |
| OHWM Height: | OHWM Indi (check all that a | | ☐ Clear line on bank | e □Shelving | □Wrested vegetation | □Scouring ⊠Wat stainin | |
| <u>4.5</u> ft. | □Ben vegeta | t, matted, or m tion | nissing □Wrack line | □Litter and debris | I □ Abrupt plant community cha | ☐Soil characteristic chanç ange | ge |
| Depth of Water: | I | Bank heig | ht (average): | | Bank slope (aver | age): | |
| N/A□ | _ft. | | <u>30</u> ft. | | _ | 50 degrees | |
| Qualitative Attrib | outes | <u>'</u> | | | <u> </u> | | |
| Water Appearance: (check one) | □No water □ | Clear □T | Γurbid □Sheer on surfa | | e □Algal ⊠0 mats | Other: Tannic water | |
| Substrate: (check all that apply) | ☐ Bedrock ☐ B | oulder \square C | cobble | ⊠ Sand ⊠ S | Silt/ clay ⊠ Organic | ☐ Other: | |
| % of Substrate: | % | % | %% | <u>10 </u> % <u>70</u> | <u>20</u> % | % | |
| Width of Riparian Zoi | | | | | | | |
| ft. | (check all that | apply) | ⊠ Trees: | ⊠ Sa | aplings/Shrubs: | ☐ Herbs | |
| N/A⊠ | Avg. DBH (approx.) | of Dominants | s: _ <u>8</u> _in. | <u>_2</u> _i | n. | | |
| Dominant Bank Vege | tation (list): | | | | | | |
| Red Maple, Ameri | ican Beech, Re | d Oak, Pin (| Oak, Christmas | Fern, Americar | n Holly | | |
| Aquatic Habitats (ex: s | submerged or emerged ac | quatic vegetation, o | overhanging banks/roots, le | af packs, large submerge | ed wood, riffles, deep pools, e | tc.): | |
| Submerged logs (| 4 – 10 inch diar | neter) | | | | | |
| Aquatic Organisms C | Observed (list): | | | | | | |
| None | | | | | | | |
| T&E Species Observe | ed (list): | | | | | | |
| None | | | | | | | |
| Disturbances (ex: live: Three foot diameter) | | • | 5 , | the waterbody | outside the corride | or. | |
| Waterbody is: (check one) | ☐ Natural | | Artificial, man-made | e 🛛 Manipulat | ed | | |
| Waterbody Quality a: (check one) | ⊟ High | | Moderate | □ Low | | | |

| Waterbody | ID |
|----------------------|----|
| Waterbody OHLC001 | |

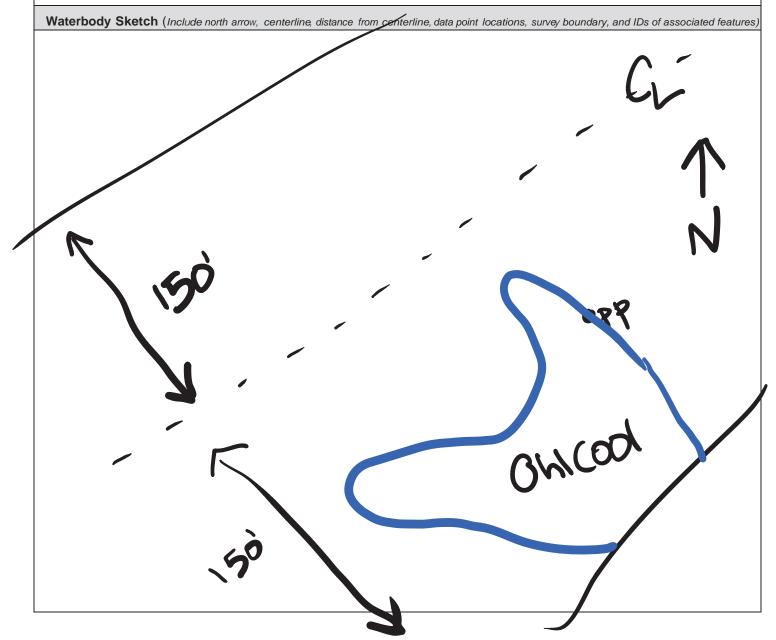
^a **High Quality:** Natural, natural bank vegetation around entire waterbody; banks stable and protected by roots; water color is clear to tea-colored; no barriers to fish movement; many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man.

Moderate Quality: Altered by rip-rap; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function or bank vegetation only moderately compromised; banks moderately unstable; water color is cloudy, submerged objects covered with greenish film; moderate odor; minor barriers to fish movement; fair aquatic habitat; minimum disturbance by livestock or man.

Low Quality: Rip rap and channelization excessive; natural vegetation less than 1/3 of the active channel width on each side; lack of regeneration; filtering function severely compromised; banks unstable (eroding); water color is muddy and turbid; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; severe barriers to fish movement; little to no aquatic habitat; severe disturbance from livestock or man.

Notes:

Beaver signs were observed within the waterbody.





Open waterbody OHLC001 facing south



Open waterbody OHLC001 facing east



Open waterbody OHLC001 facing west

| USACE AID# | | |
|------------|--|--|
| USACE AID# | | |
| | | |

| 1000 | 200 | 200 | Distance of | |
|------|-----|-----|-------------|--|
| D | 11/ | 0 | 44 | |
| 11 | w | 11 | # | |
| | | | | |

| e# | (indicate | on | attached | map' |) |
|----|-----------|----|----------|------|---|





Sh10003 Provide the following information for the stream reach under assessment: 2. Evaluator's name: NRG 1. Applicant's name: Dominion 3. Date of evaluation: 12/17/14 4. Time of evaluation: 11:00 5. Name of stream: UNT to Mush Island Gut 6. River basin: Roanoke 8. Stream order: 151 7. Approximate drainage area: 50 acces 9. Length of reach evaluated: 100 F+ 10. County: Halifax 11. Site coordinates (if known): prefer in decimal degrees. 12. Subdivision name (if any):_ N Longitude (ex. -77.556611): 77° 35′ 04. 963″ Latitude (ex. 34.872312): 36°24'60. 699" Method location determined (circle): GPS Topo Sheet Ortho (Aerial) Photo/GIS Other GIS Other_ 13. Location of reach under evaluation (note nearby roads and landmarks and attach map identifying stream(s) location):_ 14. Proposed channel work (if any): None 15. Recent weather conditions: Ran 16. Site conditions at time of visit: Norma NASection 10 NATidal Waters NASsection Fisheries Habitat 17. Identify any special waterway classifications known: NA Trout Waters NA Outstanding Resource Waters NA Nutrient Sensitive Waters NAWater Supply Watershed (I-IV) 18. Is there a pond or lake located upstream of the evaluation point? YES (NO) If yes, estimate the water surface area:___ 19. Does channel appear on USGS quad map? YES (NO) 20. Does channel appear on USDA Soil Survey? YES (NO) % Commercial 21. Estimated watershed land use: % Residential % Industrial ____% Agricultural 100 % Forested % Cleared / Logged ____% Other (_ 23. Bank height (from bed to top of bank): 1,5++ 22. Bankfull width: 24. Channel slope down center of stream: Flat (0 to 2%) Gentle (2 to 4%) Moderate (4 to 10%) Steep (>10%) 25. Channel sinuosity: Straight Occasional bends \(\sqrt{\text{Frequent meander}} \) Very sinuous Braided channel Instructions for completion of worksheet (located on page 2): Begin by determining the most appropriate ecoregion based on location, terrain, vegetation, stream classification, etc. Every characteristic must be scored using the same ecoregion. Assign points to each characteristic within the range shown for the ecoregion. Page 3 provides a brief description of how to review the characteristics identified in the worksheet. Scores should reflect an overall assessment of the stream reach under evaluation. If a characteristic cannot be evaluated due to site or weather conditions, enter 0 in the scoring box and provide an explanation in the comment section. Where there are obvious changes in the character of a stream under review (e.g., the stream flows from a pasture into a forest), the stream may be divided into smaller reaches that display more continuity, and a separate form used to evaluate each reach. The total score assigned to a stream reach must range between 0 and 100, with a score of 100 representing a stream of the highest quality. Total Score (from reverse): Comments:

Date Evaluator's Signature This channel evaluation form is intended to be used only as a guide to assist landowners and environmental professionals in gathering the data required by the United States Army Corps of Engineers to make a preliminary assessment of stream quality. The total score resulting from the completion of this form is subject to USACE approval and does not imply a particular mitigation ratio or requirement. Form subject to change – version 06/03. To Comment, please call 919-876-8441 x 26.

| | # | CHARACTERISTICS | ECOREO Coastal | PION POINT | Market Commission and Property and Commission | SCORE |
|---------|----|--|-------------------|------------|---|--------|
| - 6 | | Presence of flow / persistent pools in stream | | Piedmont | Mountain | \sim |
| | 1 | (no flow or saturation = 0; strong flow = max points) | 0-5 | 0-4 | 0-5 | d |
| | 2 | Evidence of past human alteration (extensive alteration = 0; no alteration = max points) | 0-6 | 0-5 | 0-5 | 6 |
| | 3 | Riparian zone (no buffer = 0; contiguous, wide buffer = max points) | 0-6 | 0-4 | 0-5 | 4 |
| | 4 | Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points) | 0-5 | 0-4 | 0-4 | 5 |
| AL | 5 | Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points) | 0-3 | 0-4 | 0-4 | 3 |
| PHYSICA | 6 | Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points) | 0-4 | 0-4 | 0-2 | 3 |
| PH | 7 | Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points) | 0-5 | 0-4 | 0-2 | 4 |
| | 8 | Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points) | 0-6 | 0-4 | 0-2 | 3 |
| | 9 | Channel sinuosity (extensive channelization = 0; natural meander = max points) | 0-5 | 0-4 | 0-3 | 5 |
| | 10 | Sediment input (extensive deposition= 0; little or no sediment = max points) | 0-5 | 0-4 | 0-4 | 5 |
| | 11 | Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points) | NA* | 0-4 | 0-5 | NA |
| Y | 12 | Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points) | 0-5 | 0-4 | 0-5 | 5 |
| ABILITY | 13 | Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points) | 0-5 | 0-5 | 0-5 | 5 |
| | 14 | Root depth and density on banks (no visible roots = 0; dense roots throughout = max points) | 0-3 | 0-4 | 0-5 | 3 |
| LS | 15 | Impact by agriculture, livestock, or timber production (substantial impact =0; no evidence = max points) | 0-5 | 0-4 | 0-5 | 5 |
| | 16 | Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points) | 0-3 | 0-5 | 0-6 | |
| BITTAT | 17 | Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points) | 0-6 | 0-6 | 0-6 | a |
| HAB | 18 | Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points) | 0-5 | 0-5 | 0-5 | 5 |
| | 19 | Substrate embeddedness (deeply embedded = 0; loose structure = max) | NA* | 0-4 | 0-4 | AN |
| يد | 20 | Presence of stream invertebrates (see page 4) (no evidence = 0; common, numerous types = max points) | 0-4 | 0-5 | 0-5 | 0 |
| BTOLOGY | 21 | Presence of amphibians (no evidence = 0; common, numerous types = max points) | 0-4 | 0-4 | 0-4 | 0 |
| 1018 | 22 | Presence of fish (no evidence = 0; common, numerous types = max points) | 0-4 | 0-4 | 0-4 | |
| | 23 | Evidence of wildlife use (no evidence = 0; abundant evidence = max points) | 0-6 | 0-5 | 0-5 | 1 |
| | | Total Points Possible | 100 | 100 | 100 | |
| | | TOTAL SCORE (also enter on fu | rst page) | | | 68 |

^{*} These characteristics are not assessed in coastal streams.

| Date: 12/17/14 | Project/Site: S | ERP | Latitude: 36 | °24'00.699 | |
|---|----------------------------------|--|-------------------------|------------|--|
| Evaluator: NRG | County: Hal | fax | Longitude: 77°35′04.963 | | |
| Total Points: Stream is at least intermittent 28.25 f≥ 19 or perennial if ≥ 30* | Stream Determi Ephemeral Inte | Intermittent Perennial other e.g. Quad Name: | | | |
| A. Geomorphology (Subtotal = 16.5) | Absent | Weak | Moderate | Strong | |
| 1 ^a Continuity of channel bed and bank | 0 Absent | 1 | 2 | Strong 3 | |
| 2. Sinuosity of channel along thalweg | 0 | 1 | 2 | 3 | |
| 3. In-channel structure: ex. riffle-pool, step-pool, | | | | | |
| ripple-pool sequence | 0 | 1 | 2 | 3 | |
| Particle size of stream substrate | 0 | 0 | 2 | 3 | |
| 5. Active/relict floodplain | 0 | 1 | Ø | 3 | |
| 6. Depositional bars or benches | 0 | 0 | 2 | 3 | |
| 7. Recent alluvial deposits | 0 | 0 | 2 | 3 | |
| B. Headcuts | 0 | 1 | 2 | 3 | |
| 9. Grade control | 0 | 0.5 | 0 | 1.5 | |
| Natural valley | 0 | 0.5 | 1 | (1.5) | |
| 11. Second or greater order channel | (No | 0=0> | Yes : | | |
| artificial ditches are not rated; see discussions in manual | | | | | |
| 3. Hydrology (Subtotal = 6) | | | | | |
| 2. Presence of Baseflow | 0 | 1 | 2 | 3 | |
| 3. Iron oxidizing bacteria | 0 | 0 | 2 | 3 | |
| 4. Leaf litter | 1.5 | Ď | 0.5 | 0 | |
| 5. Sediment on plants or debris | 0 | 0.5 | 1 | (T.5) | |
| 6. Organic debris lines or piles | 0 | (0.5) | 1 | 1.5 | |
| 7. Soil-based evidence of high water table? | | 1=0 | Yes = | | |
| C. Biology (Subtotal = <u>5</u> , 75 | | | | | |
| 8. Fibrous roots in streambed | 3 | 2 | 1 | 0 | |
| 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 | 0 | 0.5 | 1 | 1.5 | |
| 23. Crayfish | | 0.5 | 1 | 1.5 | |
| 24. Amphibians | | 0.5 | 1 | 1.5 | |
| 25. Algae | 0 | 0.5 | 1 | 1.5 | |
| 26. Wetland plants in streambed | | (FACW = 0.75, QBL | | | |
| | nds. See n. 35 of manual | | _ 1.5 00161 - 0 | - | |
| *perennial streams may also be identified using other method | AG. OCC p. OO OI Manual | | | | |
| *perennial streams may also be identified using other methon Notes: | | | | | |



Waterbody SHLC003 facing upstream



Waterbody SHLC003 facing downstream



Waterbody SHLC003 facing across

| LICACE AID! | DIVIO # | 0:. " | // 11 |
|---------------|---------|---------|----------------------------|
| USACE AID# | DWO# | Site # | (indicate on attached map) |
| COLLEGE LINDS | 51,4" | Oite // | _ (maiouto on attached map |





| Provide the following information for the stream reach un | 2 |
|--|--|
| 1. Applicant's name: Dominion | 2. Evaluator's name: NRG |
| 3. Date of evaluation: \\\/\langle \langle \la | 4. Time of evaluation: 2:00 |
| 5. Name of stream: UNT to Mush Island Gut | 6. River basin:Roanoke |
| 7. Approximate drainage area: 25 acres | 8. Stream order: |
| 9. Length of reach evaluated: 100 FF | 10. County: Halifax |
| 11. Site coordinates (if known): prefer in decimal degrees. Latitude (ex. 34.872312): 36°23′34.675″ | 12. Subdivision name (if any):n/a Longitude (ex. =77.556611): 77° 35' 05. 7.12" |
| Method location determined (circle): GPS Topo Sheet Ortho | |
| 14. Proposed channel work (if any): None | |
| 15. Recent weather conditions: Some Tain last night | but mostly dry |
| 16. Site conditions at time of visit: Normal | |
| | _ Nutrient Sensitive Waters |
| | point? YES NO If yes, estimate the water surface area: |
| Feb. 8 9 5 36 96 96 97 9 5 5 | 20. Does channel appear on USDA Soil Survey? YES NO |
| 21. Estimated watershed land use:% Residential | % Commercial% Industrial% Agricultural |
| A | % Cleared / Logged% Other () |
| | 23. Bank height (from bed to top of bank): |
| | Gentle (2 to 4%)Moderate (4 to 10%)Steep (>10%) |
| 3 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - | X Frequent meander Very sinuous Braided channel |
| location, terrain, vegetation, stream classification, etc. Every to each characteristic within the range shown for the ecc characteristics identified in the worksheet. Scores should recharacteristic cannot be evaluated due to site or weather co comment section. Where there are obvious changes in the clinto a forest), the stream may be divided into smaller reaches | ge 2): Begin by determining the most appropriate ecoregion based on characteristic must be scored using the same ecoregion. Assign points pregion. Page 3 provides a brief description of how to review the effect an overall assessment of the stream reach under evaluation. If a poditions, enter 0 in the scoring box and provide an explanation in the character of a stream under review (e.g., the stream flows from a pasture as that display more continuity, and a separate form used to evaluate each the between 0 and 100, with a score of 100 representing a stream of the |
| Total Score (from reverse): 43 Comme | ents: |
| Evaluator's Signature Cte Regard This channel evaluation form is intended to be used only | Date 11/18/14 as a guide to assist landowners and environmental professionals in |

gathering the data required by the United States Army Corps of Engineers to make a preliminary assessment of stream quality. The total score resulting from the completion of this form is subject to USACE approval and does not imply a particular mitigation ratio or requirement. Form subject to change – version 06/03. To Comment, please call 919-876-8441 x 26.

| | ш | CIVA DA CONDUCTOR | ECOREC | ECOREGION POINT RANGE | | |
|-----------|----|--|----------|-----------------------|----------|-------|
| | # | CHARACTERISTICS | Coastal | Piedmont | Mountain | SCORE |
| | 1 | Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points) | 0 – 5 | 0-4 | 0-5 | 2 |
| | 2 | Evidence of past human alteration (extensive alteration = 0; no alteration = max points) | 0-6 | 0-5 | 0-5 | I |
| | 3 | Riparian zone (no buffer = 0; contiguous, wide buffer = max points) | 0-6 | 0-4 | 0-5 | 3 |
| | 4 | Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points) | 0-5 | 0-4 | 0-4 | 4 |
| AL | 5 | Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points) | 0-3 | 0-4 | 0-4 | 2 |
| PHYSICAL | 6 | Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points) | 0-4 | 0-4 | 0-2 | 2 |
| PH | 7 | Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points) | 0-5 | 0-4 | 0-2 |) |
| | 8 | Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points) | 0-6 | 0-4 | 0-2 | 2 |
| | 9 | Channel sinuosity (extensive channelization = 0; natural meander = max points) | 0-5 | 0-4 | 0-3 | 3 |
| | 10 | Sediment input (extensive deposition= 0; little or no sediment = max points) | 0-5 | 0-4 | 0-4 | 3 |
| | 11 | Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points) | NA* | 0-4 | 0-5 | NA |
| Y | 12 | Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points) | 0-5 | 0-4 | 0-5 | 3 |
| ILIT | 13 | Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points) | 0-5 | 0-5 | 0-5 | 3 |
| STABILITY | 14 | Root depth and density on banks (no visible roots = 0; dense roots throughout = max points) | 0 – 3 | 0-4 | 0-5 | 2 |
| S | 15 | Impact by agriculture, livestock, or timber production (substantial impact =0; no evidence = max points) | 0-5 | 0-4 | 0-5 | 2 |
| <u>-</u> | 16 | Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points) | 0-3 | 0-5 | 0-6 | 1 |
| BITAT | 17 | Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points) | 0-6 | 0-6 | 0-6 | 3 |
| HAB | 18 | Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points) | 0-5 | 0-5 | 0-5 | 4 |
| | 19 | Substrate embeddedness (deeply embedded = 0; loose structure = max) | NA* | 0-4 | 0-4 | NA |
| _ | 20 | Presence of stream invertebrates (see page 4) (no evidence = 0; common, numerous types = max points) | 0-4 | 0-5 | 0 – 5 | 0 |
| 500 | 21 | Presence of amphibians (no evidence = 0; common, numerous types = max points) | 0-4 | 0-4 | 0-4 | 0 |
| BIOLOGY | 22 | Presence of fish (no evidence = 0; common, numerous types = max points) | 0-4 | 0-4 | 0 – 4 | 0 |
| | 23 | Evidence of wildlife use (no evidence = 0; abundant evidence = max points) | 0-6 | 0-5 | 0-5 | а |
| | | Total Points Possible | 100 | 100 | 100 | 1 |
| | | TOTAL SCORE (also enter on fir | st page) | 10 | | 43 |

^{*} These characteristics are not assessed in coastal streams.

shicool

NC DWQ Stream Identification Form Version 4.11

| Date: 11/18/14 | Project/Site: SERP | Latitude: 36° 23' 34, 675° |
|--|---|----------------------------|
| Evaluator: NRG- | County: HaliFax | Longitude: 77°35' 65,712" |
| Total Points: Stream is at least intermittent 27.75 if ≥ 19 or perennial if $\geq 30^*$ | Stream Determination (circle one) Ephemeral (intermittent) Perennial | Other e.g. Quad Name: |

| A. Geomorphology (Subtotal = 1) | Absent | Weak | Moderate | Strong |
|--|--------|------|----------|--------|
| 1 ^a Continuity of channel bed and bank | 0 | 1 | 2 | (3) |
| 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 | 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 | (1) | 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 | = 0 | Yes : | = 3 |

| B. Hydrology (Subtotal = | 1() |
|--------------------------|-----|
|--------------------------|-----|

| 17. Soil-based evidence of high water table? | No = 0 | | (Yes | = 3) | |
|--|--------|-----|------|------|--|
| 16. Organic debris lines or piles | 0 | 0.5 | 1 | 1.5 | |
| 15. Sediment on plants or debris | 0 | 0.5 | 1 | 1.5 | |
| 14. Leaf litter | 1.5 | 1 | 0.5 | 0 | |
| 13. Iron oxidizing bacteria | 0 | 1 | 2 | 3 | |
| 12. Presence of Baseflow | 0 | 1 | 2 | 3 | |

| | | | A 11 11 11 11 11 11 11 11 11 11 11 11 11 | | - 13-14-14-14-14-14-14-14-14-14-14-14-14-14- | |
|----|---------|-----------|--|----|--|--|
| C. | Biology | (Subtotal | = | 5. | 75 | |

| 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) | (6) | 1 | 2 | 3 |
| 21. Aquatic Mollusks | 0 | 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 |
| 26. Wetland plants in streambed | | (FACW = 0.75:)C |)BL = 1.5 Other = | 0 |

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: No animals or algae were observed

Sketch:

Shlcood >

SHICOOL



Stream SHLC002 facing upstream



Stream SHLC002 facing downstream



Stream SHLC002 facing across

| tached map) |
|-------------|
| |





Provide the following information for the stream reach under assessment:

| Provide the following information for the stream reach und | er assessment: |
|---|--|
| 1. Applicant's name: Dominion | 2. Evaluator's name: NRG |
| 3. Date of evaluation: 11/18/14 | 4. Time of evaluation: Ya: 50 |
| 5. Name of stream: UNT to MUSY ISLAND Gut | 6. River basin:Roanoke |
| 7. Approximate drainage area: 25 acres | 8. Stream order: \\\^{5\frac{1}{2}} |
| 9. Length of reach evaluated: 100 Ft | 10. County: Halifa X |
| 11. Site coordinates (if known): prefer in decimal degrees. | 12. Subdivision name (if any): |
| Latitude (ex. 34.872312): 36° 23' 31.41" | Longitude (ex77.556611): 77° 35' 05. 793" |
| Method location determined (circle): GPS Topo Sheet Ortho (A 13. Location of reach under evaluation (note nearby roads and location) | |
| 14. Proposed channel work (if any): None | |
| 15. Recent weather conditions: Some Cain last night | t but mostly dry |
| 16. Site conditions at time of visit: Normal | |
| 17. Identify any special waterway classifications known: <u>N</u> | * Section 10 NA Tidal Waters NA Essential Fisheries Habitat |
| NA Trout Waters NA Outstanding Resource Waters NA | Nutrient Sensitive Waters <u>NA</u> Water Supply Watershed <u>NA</u> (I-IV) |
| 18. Is there a pond or lake located upstream of the evaluation po | oint? YES NO If yes, estimate the water surface area: |
| 19. Does channel appear on USGS quad map? YES NO | 20. Does channel appear on USDA Soil Survey? YES NO |
| 21. Estimated watershed land use:% Residential | % Commercial% Industrial 50_% Agricultural |
| | % Cleared / Logged% Other () |
| 22. Bankfull width: | 23. Bank height (from bed to top of bank): 8 |
| 24. Channel slope down center of stream: X Flat (0 to 2%) | Gentle (2 to 4%)Moderate (4 to 10%)Steep (>10%) |
| 25. Channel sinuosity:Straight X Occasional bends | Frequent meanderVery sinuousBraided channel |
| location, terrain, vegetation, stream classification, etc. Every to each characteristic within the range shown for the econ characteristics identified in the worksheet. Scores should reficharacteristic cannot be evaluated due to site or weather concomment section. Where there are obvious changes in the chainto a forest), the stream may be divided into smaller reaches the stream of the characteristic cannot be evaluated to site or weather concomment section. | e 2): Begin by determining the most appropriate ecoregion based on characteristic must be scored using the same ecoregion. Assign points egion. Page 3 provides a brief description of how to review the lect an overall assessment of the stream reach under evaluation. If a ditions, enter 0 in the scoring box and provide an explanation in the aracter of a stream under review (e.g., the stream flows from a pasture that display more continuity, and a separate form used to evaluate each between 0 and 100, with a score of 100 representing a stream of the |
| Total Score (from reverse): The Cotton agricultural Field. The Chamber of the Stream is it order within the Correlation. | its: Appears to Function as drainage for anal may have been straightened in the past. idor, however it & shlood Flows into the stream |
| Evaluator's Signature Su Reym | Date 11/18/14 |
| This channel evaluation form is intended to be used only a | is a guide to assist landowners and environmental professionals in |
| | Corps of Engineers to make a preliminary assessment of stream f this form is subject to USACE approval and does not imply a |
| | change – version 06/03. To Comment, please call 919-876-8441 x 26. |

STREAM QUALITY ASSESSMENT WORKSHEET ShIC COI

| # CHARACTERISTICS ECOREGION POINT RANGE | | SCORE | | | | |
|---|----|--|-----------|----------|----------|-------|
| | # | CHARACTERISTICS | Coastal | Piedmont | Mountain | SCORE |
| | 1 | Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points) | 0-5 | 0-4 | 0 – 5 | 3 |
| | 2 | Evidence of past human alteration (extensive alteration = 0; no alteration = max points) | 0-6 | 0-5 | 0-5 | 1 |
| | 3 | Riparian zone (no buffer = 0; contiguous, wide buffer = max points) | 0-6 | 0-4 | 0-5 | 3 |
| | 4 | Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points) | 0 – 5 | 0-4 | 0-4 | 4 |
| AL | 5 | Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points) | 0-3 | 0-4 | 0-4 | 2 |
| PHYSICAL | 6 | Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points) | 0-4 | . 0 – 4 | 0-2 | 1 |
| H | 7 | Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points) | 0 - 5 | 0-4 | 0-2 | |
| | 8 | Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points) | 0-6 | 0-4 | 0-2 | 2 |
| | 9 | Channel sinuosity (extensive channelization = 0; natural meander = max points) | 0-5 | 0-4 | 0 – 3 | |
| | 10 | Sediment input (extensive deposition= 0; little or no sediment = max points) | 0-5 | 0-4 | 0-4 | 3 |
| | 11 | Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points) | NA* | 0-4 | 0-5 | NA |
| Y | 12 | Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points) | 0-5 | 0-4 | 0-5 | 3 |
| | 13 | Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points) | 0-5 | 0-5 | 0-5 | 3 |
| STABILITY | 14 | Root depth and density on banks (no visible roots = 0; dense roots throughout = max points) | 0 – 3 | 0-4 | 0-5 | 2 |
| n | 15 | Impact by agriculture, livestock, or timber production (substantial impact =0; no evidence = max points) | 0-5 | 0-4 | 0-5 | 3 |
| | 16 | Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points) | 0-3 | 0-5 | 0-6 | 2 |
| BITAL | 17 | Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points) | 0-6 | 0-6 | 0-6 | 4 |
| HAB | 18 | Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points) | 0 – 5 | 0-5 | 0-5 | 4 |
| | 19 | Substrate embeddedness (deeply embedded = 0; loose structure = max) | NA* | 0-4 | 0-4 | NA |
| ا بد | 20 | Presence of stream invertebrates (see page 4) (no evidence = 0; common, numerous types = max points) | 0-4 | 0-5 | 0-5 | 0 |
| BIOLOGY | 21 | Presence of amphibians (no evidence = 0; common, numerous types = max points) | 0-4 | 0-4 | 0-4 | O |
| SIOI | 22 | Presence of fish (no evidence = 0; common, numerous types = max points) | 0 – 4 | 0-4 | 0-4 | 0 |
| | 23 | Evidence of wildlife use (no evidence = 0; abundant evidence = max points) | 0 - 6 | 0-5 | 0 – 5 | 2 |
| | | Total Points Possible | 100 | 100 | 100 | |
| | | TOTAL SCORE (also enter on fi | rst page) | | | 44 |

^{*} These characteristics are not assessed in coastal streams.

NC DWQ Stream Identification Form Version 4.11

shicool

| Date: 11/18/14 | Project/Site: | SERP | Latitude: 36 | 23'31.41 | |
|---|------------------------|---|---|----------|--|
| Evaluator: NRG | County: Halifax | | Longitude: 77° 35' 05.793 | | |
| Total Points: Stream is at least intermittent if ≥ 19 or perennial if $\geq 30^*$ | Stream Determin | nation (circle one) mittent Perennial | Other e.g. Quad Name: | | |
| A. Geomorphology (Subtotal = _ 8) | Absent | Weak | Moderate | Strong | |
| 1 ^a Continuity of channel bed and bank | 0 | 1 | 2 | (3) | |
| 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 | 2 | 3 | |
| 5. Active/relict floodplain | 0 | 1 | 2 | 3 | |
| 6. Depositional bars or benches | 0 | 0 | 2 | 3 | |
| 7. Recent alluvial deposits | 0 | 1 | 2 | 3 | |
| 8. Headcuts | 0 | 1 | 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 | = 0 | Yes = | = 3 | |
| a artificial ditches are not rated; see discussions in manual | | | | | |
| B. Hydrology (Subtotal = 11.5) | | :t: | Section Control of | | |
| 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 | 0 | (0.5) | 1 | 1.5 | |
| 16. Organic debris lines or piles | 0 | 0.5 | (1) | 1.5 | |
| 17. Soil-based evidence of high water table? | No | = 0 | (Yes = | 3 | |
| C. Biology (Subtotal = 4.75) | | 1001100-1 | 2 2 7 7 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | 1000 | |
| 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) | (0) | 1 | 2 | 3 | |
| 21. Aquatic Mollusks | (0) | 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 | |
| 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: No animals or algae were obs | ierved | NAME OF THE PARTY | | | |
| Notes: No animals of algae were obs | | | | | |
| Sketch: | J Shie | 001 | | | |



Stream SHLC001 facing upstream



Stream SHLC001 facing downstream



Stream SHLC001 facing across

| - | | - | 3.14 | |
|-----|-----|----|------|--|
| 1.3 | 14/ | 0 | 44 | |
| - | V V | 10 | 27 | |

| | te | # | (indica | te on | attached | map |
|--|----|---|---------|-------|----------|-----|
|--|----|---|---------|-------|----------|-----|





| Provide the following information for the stream reach und | der assessment: 5h/o 003 |
|---|---|
| 1. Applicant's name: Dominion | 2. Evaluator's name: Li Roper |
| 3. Date of evaluation: 10 / 28/15 | 4. Time of evaluation: 10 am |
| 5. Name of stream: 4NT to Mush Island GAT | 6. River basin: Roundke River |
| 7. Approximate drainage area: > 50 ac | 8. Stream order: 5+ |
| 9. Length of reach evaluated: 15 ft | 10. County: Halifax |
| 11. Site coordinates (if known): prefer in decimal degrees. | 12. Subdivision name (if any): NDNC |
| Latitude (ex. 34.872312): 36.38146 | Longitude (ex77.556611): - 77, 59 071 |
| Method location determined (circle): GPS Topo Sheet Ortho (13. Location of reach under evaluation (note nearby roads and East of US-301 new White Hill Rd | landmarks and attach map identifying stream(s) location): |
| 14. Proposed channel work (if any): Proposed pipe | |
| 15. Recent weather conditions: rain within 241 | |
| 16. Site conditions at time of visit: drainage betw | veen agricultural fields |
| | Section 10Tidal WatersEssential Fisheries Habitat |
| | Nutrient Sensitive WatersWater Supply Watershed(I-IV) |
| | point? YES NO If yes, estimate the water surface area: |
| | 20. Does channel appear on USDA Soil Survey? YES NO |
| | % Commercial% Industrial% Agricultural |
| | % Cleared / Logged % Other (|
| 22. Bankfull width: 6 ft | |
| | Gentle (2 to 4%)Moderate (4 to 10%)Steep (>10%) |
| | Frequent meanderVery sinuousBraided channel |
| Instructions for completion of worksheet (located on pag location, terrain, vegetation, stream classification, etc. Every to each characteristic within the range shown for the eco characteristics identified in the worksheet. Scores should re characteristic cannot be evaluated due to site or weather con comment section. Where there are obvious changes in the ch into a forest), the stream may be divided into smaller reaches | characteristic must be scored using the same ecoregion. Assign points region. Page 3 provides a brief description of how to review the flect an overall assessment of the stream reach under evaluation. If a nditions, enter 0 in the scoring box and provide an explanation in the maracter of a stream under review (e.g., the stream flows from a pasture that display more continuity, and a separate form used to evaluate each the between 0 and 100, with a score of 100 representing a stream of the |
| Total Score (from reverse): 55 Comme | nts: |
| | |
| gathering the data required by the United States Army quality. The total score resulting from the completion | Date 10/28/15 as a guide to assist landowners and environmental professionals in Corps of Engineers to make a preliminary assessment of stream of this form is subject to USACE approval and does not imply a subject to USACE approval approval approval approval |
| particular mitigation ratio or requirement. Form subject to | change – version 06/03. To Comment, please call 919-876-8441 x 26. |

| 15 | | | ECOREC | SION POINT | RANGE | SCORE |
|------------|----|--|------------|------------|----------|-------|
| | # | CHARACTERISTICS | Coastal | Piedmont | Mountain | SCORE |
| | 1 | Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points) | 0-5 | 0-4 | 0-5 | 4 |
| PHYSICAL | 2 | Evidence of past human alteration (extensive alteration = 0; no alteration = max points) | 0-6 | 0-5 | 0-5 | 2 |
| | 3 | Riparian zone (no buffer = 0; contiguous, wide buffer = max points) | 0-6 | 0-4 | 0-5 | 3 |
| | 4 | Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points) | 0-5 | 0-4 | 0-4 | 2 |
| | 5 | Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points) | 0-3 | 0-4 | 0-4 | 3 |
| SIC | 6 | Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points) | 0-4 | 0-4 | 0-2 | 3 |
| I H | 7 | Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points) | 0-5 | 0-4 | 0-2 | 3 |
| | 8 | Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points) | 0-6 | 0-4 | 0-2 | 3 |
| | 9 | Channel sinuosity (extensive channelization = 0; natural meander = max points) | 0-5 | 0-4 | 0-3 | 3 |
| | 10 | Sediment input (extensive deposition= 0; little or no sediment = max points) | 0-5 | 0-4 | 0-4 | 2 |
| | 11 | Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points) | NA* | 0-4 | 0-5 | |
| X | 12 | Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points) | 0-5 | 0-4 | 0-5 | 3 |
| | 13 | Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points) | 0-5 | 0-5 | 0-5 | 5 |
| STABILITY | 14 | Root depth and density on banks (no visible roots = 0; dense roots throughout = max points) | 0-3 | 0-4 | 0-5 | 3 |
| 2 | 15 | Impact by agriculture, livestock, or timber production (substantial impact =0; no evidence = max points) | 0-5 | 0-4 | 0-5 | 3 |
| | 16 | Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points) | 0-3 | 0-5 | 0-6 | 0 |
| Y | 17 | Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points) | 0-6 | 0-6 | 0-6 | 4 |
| HABITAL | 18 | Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points) | 0-5 | 0-5 | 0-5 | 3 |
| A STATE OF | 19 | Substrate embeddedness (deeply embedded = 0; loose structure = max) | NA* | 0-4 | 0-4 | > |
| | 20 | Presence of stream invertebrates (see page 4) (no evidence = 0; common, numerous types = max points) | 0-4 | 0-5 | 0-5 | 0 |
| 067 | 21 | Presence of amphibians (no evidence = 0; common, numerous types = max points) | 0-4 | 0-4 | 0-4 | 3 |
| BIOLOGY | 22 | Presence of fish (no evidence = 0; common, numerous types = max points) | 0-4 | 0-4 | 0-4 | 6 |
| B | 23 | Evidence of wildlife use (no evidence = 0; abundant evidence = max points) | 0-6 | 0-5 | 0-5 | 3 |
| | | Total Points Possible | 100 | 100 | 100 | |
| | | TOTAL SCORE (also enter on fi | irst page) | | | 55 |

^{*} These characteristics are not assessed in coastal streams.

Shlo 003 NC DWO Stream Identification Form Version 4.11 Latitude: 36,38146 Date: 10128/15 Project/Site: Longitude: - 77.5907/ Evaluator: County: **Total Points:** e.g. Quad Name: Stream Determination (circle one) Stream is at least intermittent Ephemeral Intermittent Perennial if ≥ 19 or perennial if ≥ 30* A. Geomorphology (Subtotal = Absent Weak Moderate Strong 1a. Continuity of channel bed and bank 0 1 (2) 3 0 1 (2 3 2. Sinuosity of channel along thalweg 3. In-channel structure: ex. riffle-pool, step-pool, 0 2 3 1 ripple-pool sequence (6) 3 4. Particle size of stream substrate 2 2 3 5. Active/relict floodplain 1 0 2 3 6. Depositional bars or benches 0) 1 2 3 7. Recent alluvial deposits 0 1 2 3 8. Headcuts 0 1 0.5 1.5 9. Grade control 0 1 0.5 1 1.5 10. Natural valley 0 11. Second or greater order channel No = 0Yes = 3artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = 12. Presence of Baseflow 2 (3) 1 0 13. Iron oxidizing bacteria 1 2 3 1.5 (0.5) 0 14. Leaf litter 0 (0.5) 1.5 15. Sediment on plants or debris 1 16. Organic debris lines or piles (0) 1 1.5 0.5 17. Soil-based evidence of high water table? No = 0Yes = 3 C. Biology (Subtotal = 10.75 0 2) 18. Fibrous roots in streambed 3 1 19. Rooted upland plants in streambed (3) 2 1 0 3 2 20. Macrobenthos (note diversity and abundance) (0) 1 2 3 21. Aquatic Mollusks 0 1 0) 0.5 1 1.5 22. Fish 0 1.5 0.5 23. Crayfish 0.5 (1) 1.5 24. Amphibians 0 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: whigool shboos Sketch:

Top of Bank! 6ft width OHWM:4ft

Environmental Field Surveys Waterbody Photo Page



Waterbody shlo003 facing south upstream.



Waterbody shlo003 facing north downstream.

Environmental Field Surveys Waterbody Photo Page



NC DWQ Stream Identification Form Version 4.11

| Date: 12/08/15 | Project/Site: ACP | Latitude: 36.3769 |
|---|---|----------------------------------|
| Evaluator: | County: Halifax | Longitude: _77, 5 9 38 |
| Total Points: Stream is at least intermittent 32.5 if ≥ 19 or perennial if $\geq 30^*$ | Stream Determination (circle one) Ephemeral Intermittent Perennial | Other SINFOOI e.g. Quad Name: |

| A. Geomorphology (Subtotal = 19.5 | Absent | Weak | Moderate | Strong |
|--|---------------------|--------------|---------------------------------------|----------|
| 1 ^{a.} Continuity of channel bed and bank | 0 | 1 | 2 | <u>3</u> |
| 2. Sinuosity of channel along thalweg | 0 | 1 | QX/ | 3 |
| In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence | 0 | 1 | 0 | 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 | 0 | 2 | 3 |
| 7. Recent alluvial deposits | 0 | (1) | 2 | 3 |
| 8. Headcuts | 6 | 1 | 2 | 3 |
| 9. Grade control | 0 | 0.5 | 0 | 1.5 |
| 10. Natural valley | 0 | 0.5 | 1 | (1.5) |
| 11. Second or greater order channel | No | = 0 | (es: | = 3) |
| artificial ditches are not rated; see discussions in manual | 0 | 3 | *7 3 | |
| B. Hydrology (Subtotal = <u>7.5</u>) | | | | |
| 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 | 0 | 0.5 | 1 | 1.5 |
| 16. Organic debris lines or piles | 0 | (0.5) | 1 | 1.5 |
| 17. Soil-based evidence of high water table? | No | = 0 | Yes: | = 3 |
| C. Biology (Subtotal = 5.5) | Ü | 115 | - 3 | 3 |
| 18. Fibrous roots in streambed | 3 | 0 | 1 | 0 |
| 19. Rooted upland plants in streambed | 3 | <u>(1)</u> | 1 | 0 |
| 20. Macrobenthos (note diversity and abundance) | 0 | (1) | 2 | 3 |
| 21. Aquatic Mollusks | (O) | 1 | 2 | 3 |
| 22. Fish | (O) | 0.5 | 1 | 1.5 |
| 23. Crayfish | | 0.5 | 1 | 1.5 |
| 24. Amphibians | | Ø9 | 1 | 1.5 |
| 25. Algae | 0 | 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 methods. \$ | See p. 35 of manual | | | |
| Notes: | 0 | 5.4 | | |
| | | | \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ | |
| Sketch: | | JUL 1 | 选儿 | |
| | | / | | |
| | | / | , | |

| USACE AID# | DWQ # |
|------------|-------|

| C | ite | -11 | |
|---|-----|-----|--|
| O | пе | # | |

(indicate on attached map)



STREAM QUALITY ASSESSMENT WORKSHEET

| Provide the following information for the stream reach und | er assessment: |
|---|---|
| 1. Applicant's name: | 2. Evaluator's name: Stephen Huffman |
| 3. Date of evaluation: 12/8/15 | 4. Time of evaluation: \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ |
| 5. Name of stream: Unamed | 6. River basin: Roanole |
| 7. Approximate drainage area: | 8. Stream order: 2nd |
| 9. Length of reach evaluated: 300' | 10. County: Hal, Fax |
| 11. Site coordinates (if known): prefer in decimal degrees. | 12. Subdivision name (if any): |
| Latitude (ex. 34.872312): 36.3769 | Longitude (ex77.556611): - 77. 5938 |
| Method location determined (circle): GPS Topo Sheet Ortho (A 13. Location of reach under evaluation (note nearby roads and l R + 30 | Aerial) Photo/GIS Other GIS Other |
| 14. Proposed channel work (if any): | |
| 15. Recent weather conditions: Rainfall in pas | + 24 hrs |
| 16. Site conditions at time of visit: Normal | |
| 17. Identify any special waterway classifications known: | Section 10Tidal WatersEssential Fisheries Habitat |
| | Nutrient Sensitive WatersWater Supply Watershed(I-IV) |
| 18. Is there a pond or lake located upstream of the evaluation po | oint? YES NO If yes, estimate the water surface area: |
| 19. Does channel appear on USGS quad map? YES NO | 20. Does channel appear on USDA Soil Survey? YES NO |
| 21. Estimated watershed land use: 10 % Residential | % Commercial% Industrial% Agricultural |
| 30% Forested | % Cleared / Logged% Other (|
| 22. Bankfull width: 15' | 23. Bank height (from bed to top of bank): |
| 24. Channel slope down center of stream:Flat (0 to 2%) | Gentle (2 to 4%)Moderate (4 to 10%)Steep (>10%) |
| 25. Channel sinuosity:StraightOccasional bends | Frequent meanderVery sinuousBraided channel |
| location, terrain, vegetation, stream classification, etc. Every to each characteristic within the range shown for the econ characteristics identified in the worksheet. Scores should refund characteristic cannot be evaluated due to site or weather concomment section. Where there are obvious changes in the chainto a forest), the stream may be divided into smaller reaches to reach. The total score assigned to a stream reach must range highest quality. | e 2): Begin by determining the most appropriate ecoregion based on characteristic must be scored using the same ecoregion. Assign points region. Page 3 provides a brief description of how to review the lect an overall assessment of the stream reach under evaluation. If a ditions, enter 0 in the scoring box and provide an explanation in the aracter of a stream under review (e.g., the stream flows from a pasture that display more continuity, and a separate form used to evaluate each between 0 and 100, with a score of 100 representing a stream of the lats: |
| | |
| Evaluator's Signature All MM | Date 12/8/15 |
| This channel evaluation form is intended to be used only | as a guide to assist landowners and environmental professionals in |

gathering the data required by the United States Army Corps of Engineers to make a preliminary assessment of stream quality. The total score resulting from the completion of this form is subject to USACE approval and does not imply a particular mitigation ratio or requirement. Form subject to change – version 06/03. To Comment, please call 919-876-8441 x 26.

| CWA PAGENDAGENCO | ECOREG | ION POINT | Γ RANGE | SCOPE |
|--|-----------|---|----------|-------|
| CHARACTERISTICS | Coastal | Piedmont | Mountain | SCORE |
| Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points) | 0 – 5 | 0-4 | 0 – 5 | 4 |
| Evidence of past human alteration (extensive alteration = 0; no alteration = max points) | 0-6 | 0-5 | 0-5 | 4 |
| Riparian zone (no buffer = 0; contiguous, wide buffer = max points) | 0 – 6 | 0-4 | 0 – 5 | 4 |
| Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points) | 0 – 5 | 0-4 | 0-4 | 1 |
| Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points) | 0 – 3 | 0-4 | 0 – 4 | 2 |
| Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points) | 0 – 4 | 0-4 | 0-2 | 2 |
| Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points) | 0 – 5 | 0-4 | 0-2 | 3 |
| Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points) | 0-6 | 0-4 | 0 – 2 | 3 |
| Channel sinuosity (extensive channelization = 0; natural meander = max points) | 0-5 | 0 – 4 | 0-3 | 3 |
| Sediment input (extensive deposition= 0; little or no sediment = max points) | 0-5 | 0 – 4 | 0 – 4 | 2 |
| Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points) | NA* | 0-4 | 0-5 | |
| Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points) | 0-5 | 0-4 | 0 – 5 | 4 |
| Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points) | 0-5 | 0-5 | 0-5 | 4 |
| Root depth and density on banks (no visible roots = 0; dense roots throughout = max points) | 0-3 | 0 – 4 | 0-5 | 2 |
| Impact by agriculture, livestock, or timber production (substantial impact =0; no evidence = max points) | 0-5 | 0-4 | 0 – 5 | 3 |
| Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points) | 0-3 | 0 – 5 | 0-6 | 1 |
| Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points) | 0-6 | 0-6 | 0-6 | 3 |
| Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points) | 0 – 5 | 0 – 5 | 0-5 | 3 |
| Substrate embeddedness (deeply embedded = 0; loose structure = max) | NA* | 0-4 | 0-4 | |
| Presence of stream invertebrates (see page 4) (no evidence = 0; common, numerous types = max points) | 0-4 | 0 – 5 | 0-5 | 2 |
| Presence of amphibians (no evidence = 0; common, numerous types = max points) | 0-4 | 0 – 4 | 0-4 | 0 |
| Presence of fish (no evidence = 0; common, numerous types = max points) | 0 – 4 | 0 – 4 | 0-4 | 0 |
| Evidence of wildlife use (no evidence = 0; abundant evidence = max points) | 0-6 | 0-5 | 0-5 | 3 |
| Total Points Possible | 100 | 100 | 100 | |
| TOTAL SCORE (also enter on fi | rst page) | | | 53 |
| | | Total Points Possible 100 TOTAL SCORE (also enter on first page) | | |

^{*} These characteristics are not assessed in coastal streams.



Waterbody shlf001 facing north upstream



Waterbody shlf001 facing south downstream



Waterbody shlf001 facing west across

NC DWQ Stream Identification Form Version 4.11

Date: \(\frac{1}{2} \langle 6 \rangle 15 \)

Project/Site: ACP

Latitude: 36.375

Evaluator: Halifax Longitude: 77.5986

Total Points:

Stream is at least intermittent if \geq 19 or perennial if \geq 30*

Stream Determination (circle one)
Ephemeral Intermittent Perennial

eam Determination (circle one) Other Shl+W? nemeral Intermittent Perennial e.g. Quad Name:

| A. Geomorphology (Subtotal = 4 | Absent | Weak | Moderate | Strong |
|--|--------|------------|----------|----------|
| 1 ^{a.} Continuity of channel bed and bank | 0 | 1 | 2 | 3 |
| 2. Sinuosity of channel along thalweg | 0 | 1 | (2) | 3 |
| In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence | 0 | Q | .2 | 3 |
| 4. Particle size of stream substrate | 0 | (1) | 2 | 3 |
| 5. Active/relict floodplain | 0 | (1) | 2 | 3 |
| 6. Depositional bars or benches | (2) | 1 | 2 | 3 |
| 7. Recent alluvial deposits | | 1 | 2 | 3 |
| 8. Headcuts | (0) | 1 | 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 | - Av | 0=0 | Yes | = 3 |

^a artificial ditches are not rated; see discussions in manual

| B. Hydrology (Subto | otal = 4.5) |
|---------------------|--------------|
|---------------------|--------------|

| 12. Presence of Baseflow | 0 | (| 2 | 3 |
|--|-----|----------|-----|-----|
| 13. Iron oxidizing bacteria | 0 | 1 | 2 | 3 |
| 14. Leaf litter | 1.5 | 1 | 0.5 | 0 |
| 15. Sediment on plants or debris | | 0.5 | 1 | 1.5 |
| 16. Organic debris lines or piles | (0) | 0.5 | 1 | 1.5 |
| 17. Soil-based evidence of high water table? | N | o = 0 | Yes | = 3 |

| \sim | Riology | (Subtota | 1 | 9.75 |
|--------|---------|----------|---|------|

| (3) | 2 | 1 | 0 |
|----------------------------------|-----|-----------------------|----------------------|
| (3) | 2 | 1 | 0 |
| Q | (1) | 2 | 3 |
| | 1 | 2 | 3 |
| 0 | 0.5 | 0 | 1.5 |
| 0 | 0.5 | | 1.5 |
| (0) | 0.5 | 1 | 1.5 |
| 70 | 0.5 | 1 | 1.5 |
| FACW = 0.75; OBL = 1.5 Other = 0 | | | 0 |
| | | 0 0.5 0 0.5 0.5 | 0 0.5 (1) 0 0.5 1 |

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Depply incised Chanel, Minnows/Cayfish Present, low base Ilea

Sketch:



| USACE AID# | USACE | E AID# |
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| | | |

(indicate on attached map)



STREAM QUALITY ASSESSMENT WORKSHEET

| Provide the following information for the stream reach un | der assessment: | | |
|---|--|--|--|
| 1. Applicant's name: | 2. Evaluator's name: Stephen Hoffmann | | |
| 3. Date of evaluation: 12/4/15 | 4. Time of evaluation: 1300 6. River basin: Roanoke | | |
| 5. Name of stream: Vonamed | 6. River basin: Koanoke | | |
| 7. Approximate drainage area: | 8. Stream order: | | |
| 9. Length of reach evaluated: 300' | 10. County: Halifax | | |
| 11. Site coordinates (if known): prefer in decimal degrees. | 12. Subdivision name (if any): | | |
| Latitude (ex. 34.872312): 36.375 | Longitude (ex77.556611): 4 77 . 5986 | | |
| | (Aerial) Photo/GIS Other GIS Other | | |
| 14. Proposed channel work (if any): Pipeline | | | |
| 15. Recent weather conditions: Rainful Poist 24 | hrs | | |
| 16. Site conditions at time of visit: Normal | | | |
| 17. Identify any special waterway classifications known: | Section 10Tidal WatersEssential Fisheries Habitat | | |
| Trout WatersOutstanding Resource Waters | Nutrient Sensitive WatersWater Supply Watershed(I-IV) | | |
| 18. Is there a pond or lake located upstream of the evaluation | point? YES NO If yes, estimate the water surface area: | | |
| 19. Does channel appear on USGS quad map? YES NO | 20. Does channel appear on USDA Soil Survey? YES | | |
| 21. Estimated watershed land use: 5% Residential | % Commercial% Industrial 45 % Agricultural | | |
| 50% Forested | % Cleared / Logged% Other (| | |
| 22. Bankfull width: \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ | 23. Bank height (from bed to top of bank): | | |
| | Gentle (2 to 4%)Moderate (4 to 10%)Steep (>10%) | | |
| 25. Channel sinuosity:StraightOccasional bends | ✓ Frequent meanderVery sinuousBraided channel | | |
| location, terrain, vegetation, stream classification, etc. Every to each characteristic within the range shown for the eccharacteristics identified in the worksheet. Scores should recharacteristic cannot be evaluated due to site or weather cocomment section. Where there are obvious changes in the cinto a forest), the stream may be divided into smaller reaches reach. The total score assigned to a stream reach must range highest quality. | ge 2): Begin by determining the most appropriate ecoregion based on y characteristic must be scored using the same ecoregion. Assign points oregion. Page 3 provides a brief description of how to review the effect an overall assessment of the stream reach under evaluation. If a ponditions, enter 0 in the scoring box and provide an explanation in the character of a stream under review (e.g., the stream flows from a pasture is that display more continuity, and a separate form used to evaluate each ge between 0 and 100, with a score of 100 representing a stream of the ents: | | |
| | | | |
| | | | |
| Evaluator's Signature Stand James | Date 12/8/15 | | |
| This channel evaluation form is intended to be used only | y as a guide to assist landowners and environmental professionals in | | |

gathering the data required by the United States Army Corps of Engineers to make a preliminary assessment of stream quality. The total score resulting from the completion of this form is subject to USACE approval and does not imply a particular mitigation ratio or requirement. Form subject to change – version 06/03. To Comment, please call 919-876-8441 x 26.

| ш | CHAP LOTHINGS | ECOREGION POINT RANGE | | | 0000 |
|-------------|--|-----------------------|----------|----------|-------|
| # | CHARACTERISTICS | | Piedmont | Mountain | SCORE |
| 1 | Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points) | 0 – 5 | 0 – 4 | 0 – 5 | 2 |
| 2 | Evidence of past human alteration (extensive alteration = 0; no alteration = max points) | 0-6 | 0-5 | 0 – 5 | 3 |
| 3 | Riparian zone (no buffer = 0; contiguous, wide buffer = max points) | 0-6 | 0-4 | 0-5 | 3 |
| 4 | Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points) | 0 – 5 | 0-4 | 0 – 4 | 4 |
| 5 | Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points) | 0 – 3 | 0 – 4 | 0-4 | 2 |
| 5 6 7 | Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points) | 0-4 | 0-4 | 0-2 | |
| 7 | Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points) | 0 – 5 | 0-4 | 0-2 | 0 |
| 8 | Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points) | 0-6 | 0-4 | 0-2 | 0 |
| 9 | Channel sinuosity (extensive channelization = 0; natural meander = max points) | 0-5 | 0 – 4 | 0 – 3 | 3 |
| 10 | Sediment input (extensive deposition= 0; little or no sediment = max points) | 0-5 | 0-4 | 0 – 4 | 3 |
| 11 | Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points) | NA* | 0-4 | 0-5 | - |
| 12 | Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points) | 0-5 | 0 – 4 | 0 – 5 | 2 |
| 13 | Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points) | 0-5 | 0-5 | 0 – 5 | 2 |
| 14 | Root depth and density on banks (no visible roots = 0; dense roots throughout = max points) | 0-3 | 0 – 4, | 0 – 5 | 1 |
| 15 | Impact by agriculture, livestock, or timber production (substantial impact =0; no evidence = max points) | 0-5 | 0-4 | 0-5 | 3 |
| 16 | Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points) | 0-3 | 0-5 | 0 – 6 | |
| 17 | Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points) | 0-6 | 0-6 | 0 – 6 | 2 |
| 18 | Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points) | 0 – 5 | 0-5 | 0-5 | 4 |
| 19 | Substrate embeddedness (deeply embedded = 0; loose structure = max) | NA* | 0-4 | 0 – 4 | |
| 20 | Presence of stream invertebrates (see page 4) (no evidence = 0; common, numerous types = max points) | 0-4 | 0 – 5 | 0 – 5 | 2 |
| 21 | Presence of amphibians (no evidence = 0; common, numerous types = max points) | 0-4 | 0-4 | 0 – 4 | 0 |
| 22 | Presence of fish (no evidence = 0; common, numerous types = max points) | 0-4 | 0 – 4 | 0 – 4 | 2 |
| 23 | Evidence of wildlife use (no evidence = 0; abundant evidence = max points) | 0-6 | 0-5 | 0 – 5 | 3 |
| | Total Points Possible | 100 | 100 | 100 | |
| | TOTAL SCORE (also enter on fi | rst page) | | | 43 |

^{*} These characteristics are not assessed in coastal streams.



Waterbody shlf002 facing north upstream



Waterbody shlf002 facing south downstream



Waterbody shlf002 facing west across

| NC DWQ Stream Identification Form Version 4.11 | | | | |
|---|--|-------|---------------------------------|--------|
| Date: 12/9/15 | Project/Site: ACP | | Latitude: 36.3744 | |
| Evaluator: | County: Halifax | | Longitude: | |
| Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30* | Stream Determination (circle one) Ephemeral Intermittent Perennial | | Other SNF003 e.g. Quad Name: | |
| A. Geomorphology (Subtotal = 0 , 5 | Absent | Weak | Moderate | Strong |
| 1 ^{a.} Continuity of channel bed and bank | 0 | 1 | (2) | 3 |
| Sinuosity of channel along thalweg | 0 | 1 | (2) | 3 |
| In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence | 0 | 0 | 2 | 3 |
| Particle size of stream substrate | 0 | (A) | 2 | 3 |
| Active/relict floodplain | Ŏ | 1 | 2 | 3 |
| Active/relict hoodplain Depositional bars or benches | 0 | 0 | 2 | 3 |
| 7. Recent alluvial deposits | Ö | 1 | 2 | 3 |
| 8. Headcuts | + - | (1) | 2 | 3 |
| 9. Grade control | 0 | (0.5) | 1 | 1.5 |
| 10. Natural valley | 0 | 0.5 | Ó | 1.5 |
| 11. Second or greater order channel | | 0=0) | Yes | |
| artificial ditches are not rated; see discussions in manual | | 0-0 | 163 | - 3 |
| | | | | |
| B. Hydrology (Subtotal = 2.2) 12. Presence of Baseflow | 0 | 1 | 2 | -3 |
| 13. Iron oxidizing bacteria | 0 | 1 | 2 | 3 |
| 14. Leaf litter | 1.5 | 1 | (0.5) | 0 |
| 15. Sediment on plants or debris | 0 | 0.5 | 1 | 1.5 |
| 16. Organic debris lines or piles | | (0.5) | 1 | 1.5 |
| 17. Soil-based evidence of high water table? No = 0 Yes = 3 | | | | L |
| C. Biology (Subtotal = 3.5) | | | | |
| 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) | 42 | 1 | 2 | 3 |
| 21. Aquatic Mollusks | | 1 | 2 | 3 |
| 22. Fish | | 0.5 | 1 | 1.5 |
| 23. Crayfish | | 0.5 | 1 | 1.5 |
| 24. Amphibians | | 0.5 | 1 | 1.5 |
| 25. Algae | 1 0 | (0.5) | 1 | 1.5 |
| 26. Wetland plants in streambed | | | | |
| *perennial streams may also be identified using other methods. See p. 35 of manual. | | | | |
| Notes: Heavy Carried W. W. Prior to Survey | | | | |
| 140003. 17600 7 1000 1011 11 2 1113 11 30 30 30 | | | | |
| Sketch: | | | | |
| OHWP1: | 2.50 | | | |
| | | | | |

| USACE AID# | DWQ # | Site # | (indicate on attached map |
|------------|-------|--------|---------------------------|
| | | | |



| g executions of the second of | A C C C C C C C C C C C C C C C C C C C |
|---|--|
| Provide the following information for the stream reach under | er assessment: |
| 1. Applicant's name: <u>Dominion</u> | 2. Evaluator's name: Steve Hoffman |
| 3. Date of evaluation: 12/9/15 | 4. Time of evaluation: 1015 |
| 5. Name of stream: Unnowed to Roanoke River | 6. River basin: Koanoke |
| 7. Approximate drainage area: | 8. Stream order: |
| 9. Length of reach evaluated: 150' | 10. County: Halifak |
| 11. Site coordinates (if known): prefer in decimal degrees. | 12. Subdivision name (if any): |
| Latitude (ex. 34.872312): 36.3744 | Longitude (ex77.556611): - 77.6 |
| Method location determined (circle): GPS Topo Sheet Ortho (A 13. Location of reach under evaluation (note nearby roads and l | |
| 14. Proposed channel work (if any): Proposed | |
| 15. Recent weather conditions: Rainfall 48 hrs price | or to survey, current: Surny, 40°F |
| 16. Site conditions at time of visit: Normal | 7 |
| 17. Identify any special waterway classifications known: | Section 10Tidal WatersEssential Fisheries Habitat |
| Trout WatersOutstanding Resource Waters | Nutrient Sensitive WatersWater Supply Watershed(I-IV) |
| 18. Is there a pond or lake located upstream of the evaluation po | oint? YES (NO) If yes, estimate the water surface area: NA |
| 19. Does channel appear on USGS quad map? YES NO | 20. Does channel appear on USDA Soil Survey? YES NO |
| 21. Estimated watershed land use: 5% Residential | % Commercial% Industrial% Agricultural |
| <u>50</u> % Forested _ | % Cleared / Logged% Other (|
| 22. Bankfull width: 3 | 23. Bank height (from bed to top of bank): 1.5 |
| 24. Channel slope down center of stream:Flat (0 to 2%) _ | Gentle (2 to 4%) |
| 25. Channel sinuosity:StraightOccasional bends | Frequent meanderVery sinuousBraided channel |
| location, terrain, vegetation, stream classification, etc. Every control to each characteristic within the range shown for the ecore characteristics identified in the worksheet. Scores should reflicate characteristic cannot be evaluated due to site or weather concomment section. Where there are obvious changes in the characteristic cannot be evaluated due to site or weather concomment section. Where there are obvious changes in the characteristic cannot be evaluated due to site or weather concomment section. | 2): Begin by determining the most appropriate ecoregion based on characteristic must be scored using the same ecoregion. Assign points egion. Page 3 provides a brief description of how to review the lect an overall assessment of the stream reach under evaluation. If a ditions, enter 0 in the scoring box and provide an explanation in the fracter of a stream under review (e.g., the stream flows from a pasture that display more continuity, and a separate form used to evaluate each between 0 and 100, with a score of 100 representing a stream of the |
| | |
| 1 (11 | |
| Evaluator's Signature AMMM | Date 12/9/15 |

This channel evaluation form is intended to be used only as a guide to assist landowners and environmental professionals in gathering the data required by the United States Army Corps of Engineers to make a preliminary assessment of stream quality. The total score resulting from the completion of this form is subject to USACE approval and does not imply a particular mitigation ratio or requirement. Form subject to change – version 06/03. To Comment, please call 919-876-8441 x 26.

| | # | CHADACTEDICTICS | ECOREC | GION POINT | RANGE | SCORE |
|--------------|----|--|-----------|------------|----------|------------|
| | # | CHARACTERISTICS | Coastal | Piedmont | Mountain | SCORE |
| | 1 | Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points) | 0 – 5 | 0-4 | 0 – 5 | 2 |
| | 2 | Evidence of past human alteration (extensive alteration = 0; no alteration = max points) | 0-6 | 0 – 5 | 0 – 5 | 5 |
| | 3 | Riparian zone (no buffer = 0; contiguous, wide buffer = max points) | 0-6 | 0-4 | 0-5 | 4 |
| | 4 | Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points) | 0-5 | 0 – 4 | 0-4 | 5 |
| AL | 5 | Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points) | 0 – 3 | 0-4 | 0 – 4 | 2 |
| PHYSICAL | 6 | Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points) | 0-4 | 0-4 | 0-2 | 1 |
| PH | 7 | Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points) | 0-5 | 0-4 | 0-2 | 1 |
| | 8 | Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points) | 0-6 | 0-4 | 0-2 | 3 |
| | 9 | Channel sinuosity (extensive channelization = 0; natural meander = max points) | 0-5 | 0-4 | 0-3 | <i>3 5</i> |
| | 10 | Sediment input (extensive deposition= 0; little or no sediment = max points) | 0-5 | 0 – 4 | 0 – 4 | 3 |
| | 11 | Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points) | NA* | 0-4 | 0-5 | MA |
| \mathbf{X} | 12 | Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points) | 0-5 | 0-4 | 0-5 | 2 |
| STABILITY | 13 | Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points) | 0-5 | 0 – 5 | 0-5 | 3 |
| AB | 14 | Root depth and density on banks (no visible roots = 0; dense roots throughout = max points) | 0-3 | 0-4 | 0-5 | 2 |
| S | 15 | Impact by agriculture, livestock, or timber production (substantial impact =0; no evidence = max points) | 0-5 | 0-4 | 0-5 | 3 |
| | 16 | Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points) | 0-3 | 0-5 | 0-6 | 1 |
| HABITAT | 17 | Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points) | 0-6 | 0-6 | 0-6 | 3 |
| 146 | 18 | Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points) | 0-5 | 0-5 | 0-5 | 4 |
| - | 19 | Substrate embeddedness (deeply embedded = 0; loose structure = max) | NA* | 0-4 | 0-4 | NA |
| | 20 | Presence of stream invertebrates (see page 4) (no evidence = 0; common, numerous types = max points) | 0-4 | 0-5 | 0-5 | 0 |
| ے ا | 21 | Presence of amphibians (no evidence = 0; common, numerous types = max points) | 0-4 | 0 – 4 | 0-4 | 0 |
| BIOLUGY | 22 | Presence of fish (no evidence = 0; common, numerous types = max points) | 0-4 | 0-4 | 0 – 4 | Ò |
| 4 | 23 | Evidence of wildlife use (no evidence = 0; abundant evidence = max points) | 0-6 | 0-5 | 8 0−5 | 1 |
| | | Total Points Possible | 100 | 100 | 100 | |
| | | TOTAL SCORE (also enter on fi | rst page) | | | DAG |

^{*} These characteristics are not assessed in coastal streams.



Waterbody shlf003 facing northwest upstream



Waterbody shlf003 facing southeast downstream



Waterbody shlf003 facing southwest across

| | | CHLH 003 |
|------------|---------|-----------------------------------|
| USACE AID# | _ DWQ # | Site # (indicate on attached map) |

| к | | и | 4 | | 7 |
|---|---|----|---|---|---|
| ٥ | J | r. | | 1 | 8 |
| B | 1 | 11 | | 1 | |



| Provide the following information for the stream reach un | der assessment: |
|---|---|
| 1. Applicant's name: Dominion | 2. Evaluator's name: DDUEST |
| 3. Date of evaluation: 7-8-14 | 4. Time of evaluation: 1009 |
| 5. Name of stream: unnamed trib to Rox | and River basin: Romano le |
| 7. Approximate drainage area: 7100 Acres | 8. Stream order: 2 nd |
| 9. Length of reach evaluated: 100 84 | 10. County: Halistan |
| 11. Site coordinates (if known): prefer in decimal degrees. | 12. Subdivision name (if any): |
| Latitude (ex. 34.872312): 36° 22' 25.80 2" | Longitude (ex77.556611): 77°36° 07.210° |
| Method location determined (circle): GPS Topo Sheet Ortho (13. Location of reach under evaluation (note nearby roads and Between U.S. 3014 Hohway | (Aerial) Photo/GIS Other GIS Otherlandmarks and attach map identifying stream(s) location): |
| 14. Proposed channel work (if any): None | |
| 15. Recent weather conditions: Manily dry | / few showers |
| 16. Site conditions at time of visit: |) to 1 |
| 17. Identify any special waterway classifications known: | Section 10 NOTidal Waters NOEssential Fisheries Habita |
| Trout Waters NHOutstanding Resource Waters N | Nutrient Sensitive Waters WAWater Supply Watershed WA (I-IV) |
| 18. Is there a pond or lake located upstream of the evaluation p | point? YES NO If yes, estimate the water surface area: |
| 19. Does channel appear on USGS quad map? YES NO | 20. Does channel appear on USDA Soil Survey? (YES) NO |
| 21. Estimated watershed land use: 5 % Residential | % Commercial% Industrial 75% Agricultural |
| 20 % Forested | % Cleared / Logged% Other (|
| 22. Bankfull width: | 23. Bank height (from bed to top of bank): |
| 24. Channel slope down center of stream: Flat (0 to 2%) | Gentle (2 to 4%)Moderate (4 to 10%)Steep (>10%) |
| 25. Channel sinuosity:Straight \(\sum_\text{Occasional bends} \) | Frequent meanderVery sinuousBraided channel |
| to each characteristic within the range shown for the ecor characteristics identified in the worksheet. Scores should ref characteristic cannot be evaluated due to site or weather con comment section. Where there are obvious changes in the characteristic cannot be evaluated due to site or weather con into a forest), the stream may be divided into smaller reaches to | e 2): Begin by determining the most appropriate ecoregion based or characteristic must be scored using the same ecoregion. Assign points region. Page 3 provides a brief description of how to review the lect an overall assessment of the stream reach under evaluation. If a ditions, enter 0 in the scoring box and provide an explanation in the aracter of a stream under review (e.g., the stream flows from a pasture that display more continuity, and a separate form used to evaluate each between 0 and 100, with a score of 100 representing a stream of the |
| Total Score (from reverse): 52 Commen | its: Incised perennel stream |
| | |
| | |
| Evaluator's Signature | Date 7-8-2014 |
| This channel evaluation form is intended to be used only a gathering the data required by the United States Army (quality. The total score resulting from the completion of | s a guide to assist landowners and environmental professionals in Corps of Engineers to make a preliminary assessment of stream f this form is subject to USACE approval and does not imply a change – version 06/03. To Comment, please call 919-876-8441 x 26. |

| | # | CHARACTERISTICS | ECORE | GION POIN | T RANGE | |
|-----------|------------|--|----------|-----------|----------|---------|
| | " | | Coastal | Piedmont | Mountain | SCORE |
| | 1 | Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points) | 0 – 5 | 0-4 | 0-5 | 5 |
| | 2 | Evidence of past human alteration (extensive alteration = 0; no alteration = max points) | 0-6 | 0-5 | 0 – 5 | 3 |
| | 3 | Riparian zone (no buffer = 0; contiguous, wide buffer = max points) | 0-6 | 0-4 | 0-5 | 3 |
| | 4 | Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points) | 0 – 5 | 0-4 | 0-4 | 3 |
| CAL | 5 | Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points) | 0-3 | 0-4 | 0-4 | 3 |
| PHYSICAL | 6 | Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points) | 0-4 | 0-4 | 0-2 | 1 |
| PH | 7 | Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points) | 0-5 | 0-4 | 0-2 | 4 |
| | 8 | Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points) | 0-6 | 0-4 | 0-2 | Ó |
| | 9 | Channel sinuosity (extensive channelization = 0; natural meander = max points) | 0-5 | 0-4 | 0-3 | 2 |
| | 10 | Sediment input (extensive deposition= 0; little or no sediment = max points) | 0 – 5 | 0-4 | 0-4 | 3 |
| | 11 | Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points) | NA* | 0-4 | 0-5 | NA 2 |
| Y | 12 | Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points) | 0-5 | 0-4 | 0-5 | 1 |
| ПП | 13 | Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points) | 0-5 | 0-5 | 0-5 | 12 |
| STABILITY | 14 | Root depth and density on banks (no visible roots = 0; dense roots throughout = max points) | 0-3 | 0-4 | 0-5 | Ī |
| S | 15 | Impact by agriculture, livestock, or timber production (substantial impact =0; no evidence = max points) | 0-5 | 0-4 | 0-5 | 2 |
| Т | 16 | Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points) | 0-3 | 0-5 | 0-6 | 2 |
| HABITAT | 17 | Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points) | 0-6 | 0-6 | 0-6 | 3 |
| HAB | 18 | Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points) | 0-5 | 0-5 | 0-5 | 4 |
| | 19 | Substrate embeddedness (deeply embedded = 0; loose structure = max) | NA* | 0-4 | 0-4 | NA |
| X | 20 | Presence of stream invertebrates (see page 4) (no evidence = 0; common, numerous types = max points) | 0-4 | 0-5 | 0-5 | 2 |
| 907 | 21 | Presence of amphibians (no evidence = 0; common, numerous types = max points) | 0-4 | 0-4 | 0-4 | 2_ |
| BIOLOGY | 22 | Presence of fish (no evidence = 0; common, numerous types = max points) | 0-4 | 0-4 | 0-4 | ţ |
| | 23 | Evidence of wildlife use (no evidence = 0; abundant evidence = max points) | 0-6 | 0-5 | 0-5 | 4 |
| | However to | Total Points Possible | 100 | 100 | 100 | · |
| | | TOTAL SCORE (also enter on fire | st page) | | | 57 |
| * T | baca al | paracteristics are not assessed in coastal streams | | | | d 1- |

^{*} These characteristics are not assessed in coastal streams.

| ivaluator: DDWEST | | 2 Reliability | Latitude: 26 | 22 25.80 |
|---|------------------------------------|---|-----------------|---|
| | County: | li fax | Longitude: 7 | 1° 36' 07. |
| otal Points: Stream is at least intermittent ≥ 19 or perennial if ≥ 30* | Stream Determin Ephemeral Inter | nation (circle one) mittent (Perennial | 1 28 33 | o Roanoke R |
| Goomorpholomy (O.L.) | | | | |
| a. Geomorphology (Subtotal = 1) a. Continuity of channel bed and bank | Absent | Weak | Moderate | Strong |
| Sinuosity of channel along thalweg | 0 | 1 | 2 | (3) |
| In-channel structure: ex. riffle-pool, step-pool, | 0 | 1 | (2) | 3 |
| ripple-pool sequence | 0 | 1 | (2) | 3 |
| Particle size of stream substrate | 0 | 1 | 2 | (3) |
| Active/relict floodplain | 0 | (1) | 2 | 3 |
| Depositional bars or benches | 0 | 1 | (2) | 3 |
| Recent alluvial deposits | 0. | 1 | (2) | 3 |
| Headcuts | (0) | 1 | 2 | 3 |
| Grade control | 0 | 0.5 | (T) | 1.5 |
| D. Natural valley | 0 | 0.5 | (1) | 1.5 |
| Second or greater order channel | | = 6) | Yes = | |
| artificial ditches are not rated; see discussions in manual | | | 165 - | - 3 |
| . Hydrology (Subtotal = 10,5) | | | | |
| 2. Presence of Baseflow | 0 | 1 | 2 | (3) |
| 3. Iron oxidizing bacteria | 0 | 1 | (2) | 3 |
| 1. Leaf litter | 1.5 | (h) | 0.5 | 0 |
| 5. Sediment on plants or debris | 0 | (0.5) | 1 1 | |
| 6. Organic debris lines or piles | 0 | 0.5 | (1) | 1.5 |
| 7. Soil-based evidence of high water table? | No: | | Yes = | 1.5 |
| . Biology (Subtotal = 8.25 | | | les - | - 3) |
| 3. Fibrous roots in streambed | 3 | 2 | | |
| Rooted upland plants in streambed | (3) | 2 | (1) | 0 |
| . Macrobenthos (note diversity and abundance) | 0 | (D) | 1 | 0 |
| . Aquatic Mollusks | | 1 | 2 2 | 3 |
| . Fish | 0 | 0.5 | 6 | 3 |
| . Crayfish | (0) | 0.5 | | 1.5 |
| . Amphibians | 1 6 | 0.5 | 20 | 1.5 |
| . Algae | 1 0 | 0.5 | | 1.5 |
| . Wetland plants in streambed | | FACW = 0.75) OBL | - 1 F Other - 0 | 1.5 |
| perennial streams may also be identified using other methods. | See n 35 of manual | TACW - 0.737 OBL | - 1.5 Other = 0 | |
| | oce p. 55 of maridal. | | | AND TO BE SEED OF THE SEED OF |
| otes: | or production and an | | | |



SHLH003 – Facing West Up Stream View



SHLH003 – Facing East Down Stream View

shlh003



SHLH003 – Facing South Cross Stream View

SHLH 004

| Paragraph Cares Tolkinson | | | |
|---------------------------|-------|--------|----------------------------|
| USACE AID# | DWO # | Site # | (indicate on our lot |
| | B#Q# | Site # | (indicate on attached map) |
| | | | • = |

| STREAM QUALITY ASSESSMENT WORKSHEET | |
|--|---------------------------|
| Provide the following information for the stream reach under assessment: | |
| 1. Applicant's name: Dominion 2. Evaluator's name: Did WEST | |
| 3. Date of evaluation: 7 9 - 14 | - |
| 5. Name of stream: UNT to Roanoke River 6. River basin: Roanoke | |
| 7. Approximate drainage area: 7 00 8. Stream order: | |
| 9. Length of reach evaluated: 100 ft 10. County: Holy from | 10 - 2 0 |
| 11. Site coordinates (if known): prefer in decimal degrees. 12. Subdivision name (if any): | |
| Latitude (ex. 34.872312): 36 22 23,418 Longitude (ex77.556611): 77 36 07.853 | |
| Method location determined (circle): GPS Topo Sheet Ortho (Aerial) Photo/GIS Other GIS Other | |
| 13. Location of reach under evaluation (note nearby roads and landmarks and attach map identifying stream(s) location): Between U.S. Highway 30 (# Hug 125 | _ |
| 14. Proposed channel work (if any): Nova | |
| 15. Recent weather conditions: Marily Day Jow Showers | - |
| 16. Site conditions at time of visit: Normal | |
| 17. Identify any special waterway classifications known: ASection 10 WATidal Waters WAEssential Fisheries Habi | _ |
| Valers Outstanding Resource Waters Waters Water Supply Watershed A (I-IV | at |
| 18. Is there a pond or lake located upstream of the evaluation point? YES NO If yes, estimate the water surface area: |) |
| 19. Does channel appear on USGS quad map? YES NO 20. Does channel appear on USDA Soil Survey? YES NO | |
| 21. Estimated watershed land use:% Residential% Commercial% Industrial% Agricultural | |
| Cleared / Logged% Other (|) |
| 22. Bankfull width: 23. Bank height (from bed to top of bank): (| |
| 24. Channel slope down center of stream: Flat (0 to 2%) Gentle (2 to 4%) Moderate (4 to 10%) Steep (>10% |) |
| 25. Channel sinuosity:Straight Occasional bendsFrequent meanderVery sinuousBraided channel | ı |
| Instructions for completion of worksheet (located on page 2): Begin by determining the most appropriate ecoregion based location, terrain, vegetation, stream classification, etc. Every characteristic must be scored using the same ecoregion. Assign point to each characteristic within the range shown for the ecoregion. Page 3 provides a brief description of how to review to characteristics identified in the worksheet. Scores should reflect an overall assessment of the stream reach under evaluation. It characteristic cannot be evaluated due to site or weather conditions, enter 0 in the scoring box and provide an explanation in the comment section. Where there are obvious changes in the character of a stream under review (e.g., the stream flows from a past into a forest), the stream may be divided into smaller reaches that display more continuity, and a separate form used to evaluate ear reach. The total score assigned to a stream reach must range between 0 and 100, with a score of 100 representing a stream of the highest quality. | on he a he he |
| Total Score (from reverse): Comments: | |

Evaluator's Signature_ Date__ This channel evaluation form is intended to be used only as a guide to assist landowners and environmental professionals in gathering the data required by the United States Army Corps of Engineers to make a preliminary assessment of stream quality. The total score resulting from the completion of this form is subject to USACE approval and does not imply a

particular mitigation ratio or requirement. Form subject to change - version 06/03. To Comment, please call 919-876-8441 x 26.

| | # | CHARACTERISTICS | ECORE | GION POINT | ΓRANGE | |
|-----------|-----|--|----------|------------|----------|-------|
| | μ" | CHARACTERISTICS | Coastal | Piedmont | Mountain | SCORE |
| 4.3 | 1 1 | Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points) | 0-5 | 0-4 | 0-5 | H |
| | 2 | Evidence of past human alteration (extensive alteration = 0; no alteration = max points) | 0-6 | 0-5 | 0 – 5 | 3 |
| 10 30 | 3 | Riparian zone (no buffer = 0; contiguous, wide buffer = max points) | 0-6 | 0-4 | 0-5 | 3 |
| | 4 | Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points) | 0-5 | 0-4 | 0-4 | 2 |
| CAL | -5 | Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points) | 0-3 | 0-4 | 0-4 | 2 |
| PHYSICAL | 6 | Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points) | 0-4 | 0-4 | 0-2 | 20 L |
| PH | 7 | Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points) | 0-5 | 0 – 4 | 0-2 | 2 |
| | 8 | Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points) | 0-6 | 0-4 | 0-2 | D |
| | 9 | Channel sinuosity (extensive channelization = 0; natural meander = max points) | 0-5 | 0-4 | 0-3 | 3 |
| | 10 | Sediment input (extensive deposition= 0; little or no sediment = max points) | 0-5 | 0-4 | 0-4 | 3 |
| | 11 | Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points) | NA* | 0-4 | 0-5 | NA |
| I.V | 12 | Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points) | 0-5 | 0-4 | 0-5 | 3 |
| IILTI | 13 | Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points) | 0-5 | 0-5 | 0-5 | 2 |
| STABILITY | 14 | Root depth and density on banks (no visible roots = 0; dense roots throughout = max points) | 0-3 | 0-4 | 0-5 | 2 |
| S | 15 | Impact by agriculture, livestock, or timber production (substantial impact =0; no evidence = max points) | 0-5 | 0-4 | 0-5 | 2 |
| T | 16 | Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points) | 0-3 | 0-5 | 0-6 | l |
| HABITAT | 17 | Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points) | 0-6 | 0-6 | 0-6 | 2 |
| HAB | 18 | Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points) | 0-5 | 0-5 | 0 – 5 | 3 |
| | 19 | Substrate embeddedness (deeply embedded = 0; loose structure = max) | NA* | 0-4 | 0-4 | NA |
| Y | 20 | Presence of stream invertebrates (see page 4) (no evidence = 0; common, numerous types = max points) | 0-4 | 0-5 | 0-5 | i |
| 90° | 21 | Presence of amphibians (no evidence = 0; common, numerous types = max points) | 0-4 | 0-4 | 0-4 | 2 |
| BIOLOGY | 22 | Presence of fish (no evidence = 0; common, numerous types = max points) | 0-4 | 0-4 | 0-4 | 0 |
| | 23 | Evidence of wildlife use (no evidence = 0; abundant evidence = max points) | 0-6 | 0-5 | 0-5 | 83 |
| | | Total Points Possible | 100 | 100 | 100 | |
| | | TOTAL SCORE (also enter on fir | st page) | | | 44 |
| + 00 | | | | | | |

^{*} These characteristics are not assessed in coastal streams.

NC Division of Water Quality –Methodology for Identification of Intermittent and Perennial Streams and Their Origins v. 4.11

| NC DWQ Stream Identification Form | Version 4.11 | ٤ | 5414004 | 1 | | |
|--|----------------------|-----------------|--------------------------|-------------|--|--|
| Date: 17. 8. 14 | Project/Site: | SERP | Latitude: 36% | 22' 25.418" | | |
| Evaluator: DDWEST | County: | 1. fax | Longitude: 77° 36' 07.83 | | | |
| Country Coun | | | | | | |
| A. Geomorphology (Subtotal = 16) | Absent | Weak | Moderate | Strong | | |
| | 0 | 1 | 6 | 3 | | |
| | 0 | 1 | (2) | 3 | | |
| 3. In-channel structure: ex. riffle-pool, step-pool, | 0 | 1 | | 3 | | |
| | | | | | | |
| Particle size of stream substrate | | | | | | |
| 5. Active/relict floodplain | | 0 | | | | |
| 6. Depositional bars or benches | | | (2) | | | |
| 7. Recent alluvial deposits | | | | | | |
| 8. Headcuts | | | | | | |
| 9. Grade control | 0 | | 400 | | | |
| 10. Natural valley | | | | | | |
| | N | 0=(0) | Yes : | = 3 | | |
| artificial ditches are not rated; see discussions in manual | | | | | | |
| B. Hydrology (Subtotal = 8, 5) | | | | | | |
| 12. Presence of Baseflow | 0 | 1 | (2) | 3 | | |
| 13. Iron oxidizing bacteria | 0 | 0 | 2 | 3 | | |
| 14. Leaf litter | 1.5 | | 0.5 | 0 | | |
| 15. Sediment on plants or debris | 0 . | 0.5 | 1 | 1.5 | | |
| 16. Organic debris lines or piles | 0 | 0.5 | 0 | 1.5 | | |
| 17. Soil-based evidence of high water table? | N | o = 0 | Yes : | 3 | | |
| C. Biology (Subtotal = 8.25) | • | | | | | |
| 18. Fibrous roots in streambed | 3 | (2) | 1 | 0 | | |
| 19. Rooted upland plants in streambed | (3) | | 1 | 0 | | |
| 20. Macrobenthos (note diversity and abundance) | 0 | (1) | 2 | 3 | | |
| | 0 | | 2 | 3 | | |
| 22. Fish | 0 | 0.5 | 1 | 1.5 | | |
| 23. Crayfish | | 0.5 | 1 | 1.5 | | |
| 24. Amphibians | | 0.5 | (1) | 1.5 | | |
| 25. Algae | 0 | (0.5) | . 1 | 1.5 | | |
| 26. Wetland plants in streambed | | FACW =(0.75) OF | BL = 1.5 Other = 0 | | | |
| | s. See p. 35 of manu | al. | | | | |
| Notes: | | | | | | |
| | , | | | | | |
| Sketch: | 7 | 1 | Shih | 003 | | |
| 111 0011 | / / | | | | | |



SHLH004 – Facing West Up Stream View



SHLH004 – Facing East Down Stream View

shlh004



SHLH004 – Facing North Cross Stream View

| USACE AID# DWQ = | Site = (indicate on attached map) |
|--|---|
| STREAM QUALITY A | SSESSMENT WORKSHEET |
| Provide the following information for the stream reach un | der assessment: |
| 1. Applicant's name: ACP | 2. Evaluator's name: ESI-J. Harbour, 15, Mur Phrey |
| 3. Date of evaluation: DOMIGION | 4. Time of evaluation: 10 30AM |
| 5. Name of stream: LINT to RODNOKE R: VEY | 6. River basin: RODNOK-E |
| 7. Approximate drainage area: 15 acres | 8. Stream order: |
| 9. Length of reach evaluated: 100 8+ | 10. County: Hall Fox |
| | 12. Subdivision name (if any): NA |
| Latitude (ex. 34.872312): 36, 37072 | 1 ongitude (ex77.556611): -77.60701 |
| 13. Location of reach under evaluation (note nearby roads and | (Aerial) Photo GIS Other GIS Other |
| 14. Proposed channel work (if any): Proposed Pig | peline |
| | |
| 16. Site conditions at time of visit: Und Star bed | |
| 17. Identify any special waterway classifications known: | Section 10Tidal WatersEssential Fisheries Habitat |
| Trout WatersOutstanding Resource Waters | Nutrient Sensitive WatersWater Supply Watershed(I-IV) |
| 18. Is there a pond or lake located upstream of the evaluation | point? YES NO If yes, estimate the water surface area: |
| 19. Does channel appear on USGS quad map? YES NO | 20. Does channel appear on USDA Soil Survey? YES |
| | ° Commercial° Industrial 60° Agricultural |
| | % Cleared Logged % Other (|
| 22. Bankfull width: 4.58+ | 23. Bank height (from bed to top of bank): 38+ |
| 24. Channel slope down center of stream:Flat (0 to 2%) | |
| 25. Channel sinuosity:StraightOccasional bends | Frequent meanderVery sinuousBraided channel |
| location, terrain, vegetation, stream classification, etc. Ever to each characteristic within the range shown for the excharacteristics identified in the worksheet. Scores should characteristic cannot be evaluated due to site or weather ecomment section. Where there are obvious changes in the into a forest), the stream may be divided into smaller reaches | age 2): Begin by determining the most appropriate ecoregion based on y characteristic must be scored using the same ecoregion. Assign points coregion. Page 3 provides a brief description of how to review the reflect an overall assessment of the stream reach under evaluation. If a conditions, enter 0 in the scoring box and provide an explanation in the character of a stream under review (e.g., the stream flows from a pasture is that display more continuity, and a separate form used to evaluate each tige between 0 and 100, with a score of 100 representing a stream of the |

Total Score (from reverse): Comments:

Evaluator's Signature Keen europhyselva Date 10/22/15

This channel evaluation form is intended to be used only as a guide to assist landowners and environmental professionals in gathering the data required by the United States Army Corps of Engineers to make a preliminary assessment of stream quality. The total score resulting from the completion of this form is subject to USACE approval and does not imply a particular mitigation ratio or requirement. Form subject to change - version 00.03. To Comment, please call \$19-876-8441 \ 26.

| # | CHARACTERISTICS | | ION POIN | The state of the s | SCOR | |
|----|--|---------|----------|--|------|--|
| # | | Coastal | Piedmont | Mountain | | |
| 1 | Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points) | 0 – 5 | 0 – 4 | 0-5 | + | |
| 2 | Evidence of past human alteration (extensive alteration = 0; no alteration = max points) | 0 – 6 | 0 – 5 | 0 – 5 | 5 | |
| 3 | Riparian zone (no buffer = 0; contiguous, wide buffer = max points) | 0-6 | 0 – 4 | 0-5 | 4 | |
| 4 | Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points) | 0 – 5 | 0-4 | 0-4 | 3 | |
| 5 | Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points) | 0 – 3 | 0 – 4 | 0-4 | 2 | |
| 6 | Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points) | 0-4 | 0-4 | 0-2 | 1 | |
| 7 | Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points) | 0 – 5 | 0-4 | 0-2 | 2 | |
| 8 | Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points) | 0 – 6 | 0-4 | 0-2 | 4 | |
| 9 | Channel sinuosity (extensive channelization = 0; natural meander = max points) | 0-5 | 0-4 | 0-3 | 4 | |
| 10 | Sediment input (extensive deposition= 0; little or no sediment = max points) | 0 – 5 | 0-4 | 0 – 4 | 4 | |
| 11 | Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points) | NA* | 0-4 | 0 – 5 | | |
| 12 | Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points) | 0-5 | 0-4 | 0-5 | 4 | |
| 13 | Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points) | 0-5 | 0-5 | 0-5 | 3 | |
| 14 | Root depth and density on banks (no visible roots = 0; dense roots throughout = max points) | 0-3 | 0-4 | 0-5 | 0 | |
| 15 | Impact by agriculture, livestock, or timber production (substantial impact =0; no evidence = max points) | 0 – 5 | 0-4 | 0-5 | 3 | |
| 16 | Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points) | 0 – 3 | 0-5 | 0-6 | 2 | |
| 17 | Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points) | 0-6 | 0-6 | 0-6 | Ч | |
| 18 | Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points) | 0-5 | 0-5 | 0 - 5 | L | |
| 19 | Substrate embeddedness (deeply embedded = 0; loose structure = max) | NA* | 0-4 | 0-4 | - | |
| 20 | Presence of stream invertebrates (see page 4) (no evidence = 0; common, numerous types = max points) | 0-4 | 0-5 | 0-5 | 0 | |
| 21 | Presence of amphibians (no evidence = 0: common, numerous types = max points) | 0-4 | 0-4 | 0-4 | (| |
| 22 | Presence of fish (no evidence = 0; common, numerous types = max points) | 0-4 | 0-4 | 0-4 | 10 | |
| 23 | Evidence of wildlife use (no evidence = 0; abundant evidence = max points) | 0-6 | 0-5 | 0-5 | L | |
| | Total Points Possible | 100 | 100 | 100 | | |

^{*} These characteristics are not assessed in coastal streams.

NC DWO Stream Identification Form Version 4.11

Ship 002

| Date: 10/22/15 | Project/Site: ACP | Latitude: 36,37072 |
|---|--|----------------------------------|
| Evaluator: ESI-J. Haxbour, IC Mulphrey | County: Hall Fax | Longitude: _77.60701 |
| Total Points: Stream is at least intermittent if ≥ 19 or perennial if $\geq 30^*$ | Stream Determination (circle one) Ephemeral Intermittent Perennial | Other Halisox e.g. Quad Name: |

| II 2 19 01 perennal II 2 30 | | | | |
|---|--------|-------|----------|--------|
| A. Geomorphology (Subtotal = 15.5) | Abaant | Weak | Moderate | Strong |
| A. Geomorphology (Subtotal = 12.2) | Absent | vveak | Moderate | - |
| 1 ^{a.} Continuity of channel bed and bank | 0 | 1 | 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 | 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 | (1) | 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 | (€0) | Yes | = 3 |
| a artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = 4,5) | | | | |
| 12. Presence of Baseflow | 0 | 1 | 2 | (3) |
| 13. Iron oxidizing bacteria | 0 | (1) | 2 | 3 |
| 14. Leaf litter | 1.5 | 1 | (0.5) | 0 |
| 15. Sediment on plants or debris | 0 | (0.5) | 1 | 1.5 |
| 16. Organic debris lines or piles | 0 | 0.5 | 1 | (1.5) |
| | | | | () |

| 12. Presence of Baseflow | 0 | 1 | 2 | (3) |
|--|--------|-------|-------|-------|
| 13. Iron oxidizing bacteria | 0 | (1) | 2 | 3 |
| 14. Leaf litter | 1.5 | 1 | (0.5) | 0 |
| 15. Sediment on plants or debris | 0 | (0.5) | 1 | 1.5 |
| 16. Organic debris lines or piles | 0 | 0.5 | 1 | (1.5) |
| 17. Soil-based evidence of high water table? | No = 0 | | Yes | (= 3) |

| 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) | 0_ | (1) | 2 | 3 |
| 21. Aquatic Mollusks | (0) | 1 | 2 | 3 |
| 22. Fish | (0) | 0.5 | 1 | 1.5 |
| 23. Crayfish | (Q) | 0.5 | 1 | 1.5 |
| 24. Amphibians | (0) | 0.5 | 1 | 1.5 |
| 25. Algae | (0) | 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 methods. See p. 35 of manual.

Notes:

Sketch:

- WhiP 991 Ship dy2

OHWM Width: 38+ Bonkfull Width: 4.58+

Environmental Field Surveys Waterbody Photo Page



Waterbody shlp002 facing north upstream.



Waterbody shlp002 facing south downstream.

Environmental Field Surveys Waterbody Photo Page



Waterbody shlp002 facing west across bank.

NC Division of Water Quality –Methodology for Identification of Intermittent and Perennial Streams and Their Origins v. 4.11

| NC DWQ Stream Identification Form | Version 4.11 | | | |
|---|----------------------|--|----------------------------|----------------|
| Date: 12/10/15 | Project/Site: A | CP | Latitude: 30 | 0.3619 |
| Evaluator: | | | Longitude: - | |
| Total Points: Stream is at least intermittent if \geq 19 or perennial if \geq 30* | | ination (circle one) ermitten (Perennial) | Other Shif e.g. Quad Name: | Cittle Quarkey |
| A. Geomorphology (Subtotal = 2/ | Absent | Weak | Moderate | Strong |
| 1 ^{a.} 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 | 4 | (3) | |
| ripple-pool sequence | 0 | 1 | <u> </u> | 3 |
| Particle size of stream substrate | 0 | 1 | (2) | 3 |
| 5. Active/relict floodplain | 0 | 1 | 2 | (3) |
| 6. Depositional bars or benches | 0 | (T) | 2 | 3 |
| 7. Recent alluvial deposits | 0 | (1) | 2 | 3 |
| 8. Headcuts | 0 | (1) | 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 | N | o = 0 | (Yes: | = 3) |
| a artificial ditches are not rated; see discussions in manual | | | - | |
| B. Hydrology (Subtotal = \$\frac{1}{2}\$) | | | | |
| 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 | 0 | (0.5) | 1 | 1.5 |
| 16. Organic debris lines or piles | 0 | (0.5) | 1 | 1.5 |
| 17. Soil-based evidence of high water table? | N | 0 = 0 | (Yes: | = 3) |
| C. Biology (Subtotal = 9.75) | | | | |
| 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) | 0 | 1 | (| 3 |
| 21. Aquatic Mollusks | 6 | 1 | 2 | 3 |
| 22. Fish | 0 | 0.5 | 1 | 1.5 |
| 23. Crayfish | 0 | 0.5 | 1 | 1.5 |
| 24. Amphibians | Ö | (0.5) | 1 | 1.5 |
| 25. Algae | 0 | (0.5) | 1 | 1.5 |
| 26. Wetland plants in streambed | | FACW = 0.75; OB | L = 1.5 Other = 0 | |
| *perennial streams may also be identified using other methods | . See p. 35 of manua | | | |
| Notes: Caddisflips "Little Quanta, cre- | | | | |
| / | <u> </u> | , | | |
| Sketch: | | 1111.) | | |
| 2.5' I | | | | |
| Othum i | 2' | 4 | | . î |

830 B: 161

| USACE AID# | DWQ # | | Site # | (indicate on attached map) |
|---|--|--|---|--|
| STR | EAM QUALITY A | ASSESSMENT W | ORKSHE | CET (1) |
| Provide the following informati | on for the stream reach un | | 11 | lic |
| 1. Applicant's name: ACP | | 2. Evaluator's name: | Stephen | Heltmann |
| 3. Date of evaluation: | 10/15 | 4. Time of evaluation | | |
| 5. Name of stream: Little (| Quantey Creak | 6. River basin: | Roan | oke |
| 7. Approximate drainage area: | J | 8. Stream order: | -d | |
| 9. Length of reach evaluated: | 300' | 10. County: tal | Fax | |
| 11. Site coordinates (if known): | | and the second s | | |
| Latitude (ex. 34.872312): 36.30 | 019 | Longitude (ex77.5566 | 511): - 77. | .6197 |
| Method location determined (circle): | | | | |
| 13. Location of reach under evalu | ation (note nearby roads and | d landmarks and attach m | ap identifying | stream(s) location): |
| | Pinalina | | III STAN I IV YOU WANTE | |
| 14. Proposed channel work (if any | | | | |
| 15. Recent weather conditions: | | | | |
| 16. Site conditions at time of visit | : Sumy 50°F | | | V |
| 17. Identify any special waterway | classifications known: _ | Section 10T | idal Waters | Essential Fisheries Habitat |
| Trout WatersOutstand | ing Resource Waters | _ Nutrient Sensitive Wat | ersWate | er Supply Watershed(I-IV) |
| 18. Is there a pond or lake located | upstream of the evaluation | point? YES NO If ye | es, estimate the | water surface area: |
| 19. Does channel appear on USG | S quad map YES NO | 20. Does channel app | ear on USDA S | Soil Survey? YES NO |
| 21. Estimated watershed land use | : 5 % Residential | % Commercial | % Indu | strial <u>B</u> % Agricultural |
| | <u>\$0</u> % Forested | % Cleared / Logge | d% Othe | er (|
| 22. Bankfull width: | | 23. Bank height (from | n bed to top of | bank): 3.5 1 |
| 24. Channel slope down center of | stream:Flat (0 to 2%) | | | (4 to 10%)Steep (>10%) |
| 25. Channel sinuosity:Strai | ghtOccasional bends | Frequent meander | ✓Very si | nuousBraided channel |
| Instructions for completion of location, terrain, vegetation, streat to each characteristic within the characteristics identified in the vecharacteristic cannot be evaluate comment section. Where there a into a forest), the stream may be reach. The total score assigned highest quality. Total Score (from reverse): | worksheet (located on page and classification, etc. Every erange shown for the econorksheet. Scores should red due to site or weather corrections changes in the edivided into smaller reaches to a stream reach must range. | ge 2): Begin by determ y characteristic must be so oregion. Page 3 provide effect an overall assessmenditions, enter 0 in the character of a stream und is that display more conting the between 0 and 100, we | ining the most accored using the des a brief de- tent of the stre- scoring box ar er review (e.g., nuity, and a sep- rith a score of | appropriate ecoregion based on e same ecoregion. Assign points scription of how to review the am reach under evaluation. If a nd provide an explanation in the the stream flows from a pasture parate form used to evaluate each |

Evaluator's Signature

This channel evaluation form is intended to be used only as a guide to assist landowners and environmental professionals in gathering the data required by the United States Army Corps of Engineers to make a preliminary assessment of stream quality. The total score resulting from the completion of this form is subject to USACE approval and does not imply a particular mitigation ratio or requirement. Form subject to change – version 06/03. To Comment, please call 919-876-8441 x 26.

| | Ш | CHAD A CONTRACTOR | ECOREC | GION POINT | Γ RANGE | ggop- |
|-----------|----|--|-----------|------------|----------|-------|
| | # | CHARACTERISTICS | | Piedmont | Mountain | SCORE |
| | 1 | Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points) | 0 – 5 | 0-4 | 0 – 5 | 5 |
| | 2 | Evidence of past human alteration (extensive alteration = 0; no alteration = max points) | 0-6 | 0 – 5 | 0 – 5 | 4 |
| | 3 | Riparian zone (no buffer = 0; contiguous, wide buffer = max points) | 0-6 | 0-4 | 0 – 5 | 6 |
| | 4 | Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points) | 0-5 | 0-4 | 0-4 | 5 |
| AL | 5 | Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points) | 0 – 3 | 0-4 | 0-4 | 3 |
| PHYSICAL | 6 | Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points) | 0-4 | 0-4 | 0-2 | 3 |
| PH | 7 | Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points) | 0-5 | 0-4 | 0-2 | 4 3 |
| | 8 | Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points) | 0-6 | 0-4 | 0-2 | 3 |
| | 9 | Channel sinuosity (extensive channelization = 0; natural meander = max points) | 0 – 5 | 0 – 4 | 0-3 | 4 |
| | 10 | Sediment input (extensive deposition= 0; little or no sediment = max points) | 0-5 | 0 – 4 | 0-4 | 3 |
| | 11 | Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points) | NA* | 0-4 | 0-5 | - |
| X | 12 | Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points) | 0-5 | 0-4 | 0 – 5 | 4 |
| STABILITY | 13 | Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points) | 0 – 5 | 0 – 5 | 0-5 | 4 |
| IAB | 14 | Root depth and density on banks (no visible roots = 0; dense roots throughout = max points) | 0 – 3 | 0-4 | 0-5 | 2 |
| S | 15 | Impact by agriculture, livestock, or timber production (substantial impact =0; no evidence = max points) | 0-5 | 0-4 | 0 – 5 | 4 |
| | 16 | Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points) | 0 – 3 | 0 – 5 | 0-6 | l l |
| HABITAT | 17 | Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points) | 0-6 | 0 – 6 | 0-6 | 3 |
| HAB | 18 | Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points) | 0-5 | 0-5 | 0 – 5 | 3 |
| | 19 | Substrate embeddedness (deeply embedded = 0; loose structure = max) | NA* | 0-4 | 0-4 | |
| X | 20 | Presence of stream invertebrates (see page 4) (no evidence = 0; common, numerous types = max points) | 0-4 | 0-5 | 0 – 5 | 2 |
| 500 | 21 | Presence of amphibians (no evidence = 0; common, numerous types = max points) | 0-4 | 0-4 | 0-4 | 1 |
| BIOLOGY | 22 | Presence of fish (no evidence = 0; common, numerous types = max points) | 0-4 | 0-4 | 0-4 | 1 |
| | 23 | Evidence of wildlife use (no evidence = 0; abundant evidence = max points) | 0-6 | 0-5 | 0-5 | 4 |
| | | Total Points Possible | 100 | 100 | 100 | |
| | | TOTAL SCORE (also enter on fi | rst page) | 100 | | 69 |

^{*} These characteristics are not assessed in coastal streams.



Waterbody shlf004 facing north upstream



Waterbody shlf004 facing southwest downstream



Waterbody shlf004 facing west across

| USACE | A | III | |
|-------|---|--------|--|
| AIH | A | 11 111 | |

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| - 1 | DWU | tt |

Site #_

(indicate on attached map)



STREAM QUALITY ASSESSMENT WORKSHEET



| Provide the following information for the stream reach und | er assessment: |
|---|--|
| 1. Applicant's name: Doninion | 2. Evaluator's name: DO West |
| 3. Date of evaluation: July 9, 26/4 | 4. Time of evaluation: //: 27 |
| 5. Name of stream: UNT to Quankey Creek | 6. River basin: Kounske |
| 7. Approximate drainage area: < 160 Acres | 8. Stream order: 13 L |
| 9. Length of reach evaluated: 300° | 10. County: //a/ Lac |
| 11 Site coordinates (if known): prefer in decimal degrees | 12. Subdivision name (if any): |
| Latitude (ex. 34.872312): 36°20′20.051″ | Longitude (ex77.556611): 77° 38' 16.690 |
| Method location determined (circle): GPS Topo Sheet Ortho (13. Location of reach under evaluation (note nearby roads and | Aerial) Photo/GIS Other GIS Other |
| 14. Proposed channel work (if any): | |
| 15. Recent weather conditions: Normal | |
| 16. Site conditions at time of visit: | |
| 17. Identify any special waterway classifications known: | Section 10Tidal WatersEssential Fisheries Habitat |
| Trout WatersOutstanding Resource Waters | Nutrient Sensitive WatersWater Supply Watershed(I-IV) |
| 18. Is there a pond or lake located upstream of the evaluation | point? YES NO If yes, estimate the water surface area: |
| 19. Does channel appear on USGS quad map? YES NO | 20. Does channel appear on USDA Soil Survey? (YES) NO |
| 21. Estimated watershed land use:% Residential | % Commercial% Industrial% Agricultural |
| 56 % Forested | % Cleared / Logged% Other () |
| 22. Bankfull width: | 23. Bank height (from bed to top of bank): |
| 24. Channel slope down center of stream: Kalendary Flat (0 to 2%) | Gentle (2 to 4%)Moderate (4 to 10%)Steep (>10%) |
| 25. Channel sinuosity:StraightOccasional bends | Frequent meanderVery sinuousBraided channel |
| location, terrain, vegetation, stream classification, etc. Every to each characteristic within the range shown for the ecc characteristics identified in the worksheet. Scores should recharacteristic cannot be evaluated due to site or weather eccomment section. Where there are obvious changes in the cinto a forest), the stream may be divided into smaller reaches reach. The total score assigned to a stream reach must ranghighest quality. | ge 2): Begin by determining the most appropriate ecoregion based on characteristic must be scored using the same ecoregion. Assign points pregion. Page 3 provides a brief description of how to review the effect an overall assessment of the stream reach under evaluation. If a anditions, enter 0 in the scoring box and provide an explanation in the character of a stream under review (e.g., the stream flows from a pasture that display more continuity, and a separate form used to evaluate each ge between 0 and 100, with a score of 100 representing a stream of the |
| Total Score (from reverse): 49 Commo | ents: Week Internal Heart |
| | |
| | |
| M. 17. K. | Date July 9, 2014 |
| Evaluator's Signature This channel evaluation form is intended to be used only | as a guide to assist landowners and environmental professionals in |
| gathering the data required by the United States Army | Corps of Engineers to make a preliminary assessment of stream of this form is subject to USACE approval and does not imply a |

particular mitigation ratio or requirement. Form subject to change - version 06/03. To Comment, please call 919-876-8441 x 26.

| | ., 1 | OV LD LOWEDVOW CO | ECOREGION POINT RANGE | | CHARACTERISTICS ECOREGION POINT RANGE | | SCORE |
|-----------|------|--|-----------------------|----------|---------------------------------------|-------|-------|
| | # | CHARACTERISTICS | Coastal | Piedmont | Mountain | SCORE | |
| | 1 | Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points) | 0 – 5 | 0-4 | 0 – 5 | 2 | |
| | 2 | Evidence of past human alteration (extensive alteration = 0; no alteration = max points) | 0-6 | 0-5 | 0-5 | Ч | |
| | 3 | Riparian zone (no buffer = 0; contiguous, wide buffer = max points) | 0-6 | 0-4 | 0-5 | 3 | |
| | 4 | Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points) | 0 – 5 | 0-4 | 0-4 | | |
| | 5 | Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points) | 0 – 3 | 0 – 4 | 0-4 | | |
| LITTOICE | 6 | Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points) | 0-4 | 0-4 | 0-2 | 2 | |
| | 7 | Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points) | 0 – 5 | 0-4 | 0-2 | 2 | |
| | 8 | Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points) | 0-6 | 0-4 | 0-2 | | |
| | 9 | Channel sinuosity (extensive channelization = 0; natural meander = max points) | 0-5 | 0-4 | 0 – 3 | 3 | |
| | 10 | Sediment input (extensive deposition= 0; little or no sediment = max points) | 0-5 | 0-4 | 0-4 | 2 | |
| | 11 | Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points) | NA* | 0-4 | 0-5 | | |
| - | 12 | Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points) | 0-5 | 0-4 | 0-5 | 2 | |
| | 13 | Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points) | 0 5 | 0-5 | 0-5 | 4 | |
| SIADILIII | 14 | Root depth and density on banks (no visible roots = 0; dense roots throughout = max points) | 0 – 3 | 0-4 | 0-5 | 2 | |
| 2 | 15 | Impact by agriculture, livestock, or timber production (substantial impact =0; no evidence = max points) | 0-5 | 0-4 | 0-5 | 2 | |
| | 16 | Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points) | 0-3 | 0-5 | 0 – 6 | 2 | |
| HABITAL | 17 | Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points) | 0-6 | 0-6 | 0-6 | 2 | |
| HAD | 18 | Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points) | 0-5 | 0-5 | 0-5 | 3 | |
| | 19 | Substrate embeddedness (deeply embedded = 0; loose structure = max) | NA* | 0-4 | 0-4 | | |
| | 20 | Presence of stream invertebrates (see page 4) (no evidence = 0; common, numerous types = max points) | 0-4 | 0-5 | 0-5 | 8 | |
| 500 | 21 | Presence of amphibians (no evidence = 0; common, numerous types = max points) | 0-4 | 0-4 | 0-4 | t | |
| BIOLUGY | 22 | Presence of fish (no evidence = 0; common, numerous types = max points) | 0-4 | 0-4 | 0-4 | 0 | |
| 1 | 23 | Evidence of wildlife use (no evidence = 0; abundant evidence = max points) | 0-6 | 0-5 | 0-5 | 3 | |
| | | Total Points Possible | 100 | 100 | 100 | | |
| | | TOTAL SCORE (also enter on f | irst page) | | | 44 | |

^{*} These characteristics are not assessed in coastal streams.

NC Division of Water Quality –Methodology for Identification of Intermittent and Perennial Streams and Their Origins v. 4.11

NC DWQ Stream Identification Form Version 4.11 Latitude: 36 20 20.05 Project/Site: Date: Longitude: 77° 38' 16.690 County: Evaluator: Other UNT to Quankey Creek **Total Points:** Stream Determination (circle one) Stream is at least intermittent Ephemeral Intermittent Perennial e.g. Qua if ≥ 19 or perennial if ≥ 30* Strong Weak Moderate Absent A. Geomorphology (Subtotal = (2 1a. Continuity of channel bed and bank 0 3 2 0 (1)2. Sinuosity of channel along thalweg 3. In-channel structure: ex. riffle-pool, step-pool, 3 2 0 1 ripple-pool sequence 3 2 (1) 0 4. Particle size of stream substrate 3 2 (1) 0 5. Active/relict floodplain 3 2 0 6. Depositional bars or benches 2 3 0 1 7. Recent alluvial deposits 3 (1) 2 0 8. Headcuts 1.5 OB 0 0.5 9. Grade control 1 1.5 0.5 0 10. Natural valley Yes = 3No FO 11. Second or greater order channel artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = 3 2 (0) 1 12. Presence of Baseflow 3 2 0 1 13. Iron oxidizing bacteria 0 1 0.5 1.5 14. Leaf litter 1.5 1) 0 0.5 15. Sediment on plants or debris 1.5 (1) 0.5 0 16. Organic debris lines or piles Yes = 3 No = 017. Soil-based evidence of high water table? C. Biology (Subtotal = 0 2) 1 3 18. Fibrous roots in streambed 0 1 3 2 19. Rooted upland plants in streambed 3 2 1 0 20. Macrobenthos (note diversity and abundance) 3 2 1 0 21. Aquatic Mollusks 1.5 1 0.5 (0) 22. Fish 1.5 1 0.5 0 23. Crayfish 1.5 (0.5) 1 0 24. Amphibians 1.5 (0) 25. Algae 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:



SHLG005 – Facing West Up Stream View



SHLG005 – Facing East Down Stream View



SHLG005 – Facing North Cross Stream View

| LIC LOD LID | | | |
|---|-------|---------|--|
| USACE AID# | DWO # | C:4 - # | 11 A 4 5 5 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 |
| Secretaries de la constante de | BwQ# | Site # | (indicate on attached map) |
| ALCOHOLOGY CONTRACTOR | | | 5. 3: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 |

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|----|----|---|----|---|---|---|
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| ш | | | ٠ | | | |



| Provide the following information for the stream reach un | der assessment: |
|--|--|
| 1. Applicant's name: Dominiou | 2. Evaluator's name: DD WEST |
| 3. Date of evaluation: $2 - (D - \mathcal{L})$ | 4. Time of evaluation: 8:40 |
| 5. Name of stream: LULAGMED to be MAIST Su | River hasin: Tar-Pamlico |
| 7. Approximate drainage area: 7 100 ACRES | 8. Stream order: |
| 9. Length of reach evaluated: DUH | 10. County: Halifax |
| 11. Site coordinates (if known): prefer in decimal degrees. | 12. Subdivision name (if any): |
| | Longitude (ex. –77.556611): 77°38'4/1.198" |
| Method location determined (circle): (GPS) Topo Sheet Ortho | (Aerial) Photo/GIS Other GIS Other |
| 13. Location of reach under evaluation (note nearby roads and | landmarks and attach map identifying stream(s) location): |
| 14. Proposed channel work (if any): None | stegory Lane |
| 15. Recent weather conditions: Main by dry | Cont |
| 16. Site conditions at time of visit: Normal | 4ew showers |
| | 4 0 10 200 424 |
| ATrout Waters NA Outstanding Resource Waters NA | Section 10 WATidal Waters MAEssential Fisheries Habitat Nutrient Sensitive Waters Mater Supply Watershed (I-IV) |
| 18. Is there a pond or lake located upstream of the evaluation p | Nutrient Sensitive Waters |
| 19. Does channel appear on USGS quad map? YES NO | |
| | 20. Does channel appear on USDA Soil Survey? YES NO |
| | % Commercial% Industrial \frac{TD\%}{D\%} Agricultural |
| 22. Bankfull width: | % Cleared / Logged% Other (|
| - Company of the Comp | 23. Bank height (from bed to top of bank): |
| 25. Channel sinusity: X Straight Occasional bonds | Gentle (2 to 4%)Moderate (4 to 10%)Steep (>10%) |
| Instructions for completion of purellaborated | Frequent meanderVery sinuousBraided channel |
| to each characteristic within the range shown for the ecor characteristics identified in the worksheet. Scores should ref characteristic cannot be evaluated due to site or weather con comment section. Where there are obvious changes in the characteristic cannot be evaluated due to site or weather con the characteristic cannot be evaluated due to site or weather con comment section. Where there are obvious changes in the characteristic cannot be evaluated due to site or weather con comment section. | e 2): Begin by determining the most appropriate ecoregion based on characteristic must be scored using the same ecoregion. Assign points region. Page 3 provides a brief description of how to review the lect an overall assessment of the stream reach under evaluation. If a ditions, enter 0 in the scoring box and provide an explanation in the aracter of a stream under review (e.g., the stream flows from a pasture hat display more continuity, and a separate form used to evaluate each between 0 and 100, with a score of 100 representing a stream of the |
| Total Score (from reverse): 25 Commen intercepted groundwater (intercepted groundwater (int | is: Man mode ditch without has |
| | |
| Evaluator's Signature Ash Moran | Date \$ 7-10-14 |
| quality. The total score resulting from the completion of | s a guide to assist landowners and environmental professionals in Corps of Engineers to make a preliminary assessment of stream this form is subject to USACE approval and does not imply a change – version 06/03. To Comment, please call 919-876-8441 x 26. |

| | # | CHARACTERISTICS | ECOREGION POINT RANGE | | | |
|---------------------|----|---|-----------------------|----------|----------|-------|
| | | | Coastal | Piedmont | Mountain | SCORE |
| | 1 | Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points) | 0-5 | 0-4 | 0-5 | 82 |
| | 2 | Evidence of past human alteration (extensive alteration = 0; no alteration = max points) | 0-6 | 0-5 | 0-5 | |
| | 3 | Riparian zone (no buffer = 0; contiguous, wide buffer = max points) | 0-6 | 0-4 | 0-5 | 1 |
| - 99.90 - 540.90 | 4 | Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points) | 0-5 | 0-4 | 0-4 | |
| PHYSICAL | 5 | Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points) | 0-3 | 0-4 | 0-4 | |
| IXXI | 6 | Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points) | 0-4 | 0-4 | 0-2 | Q |
| PF | 7 | Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points) | 0-5 | 0-4 | 0-2 | 0 |
| | 8 | Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points) Channel sinuosity | 0-6 | 0-4 | 0-2 | 0 |
| | 9 | (extensive channelization = 0; natural meander = max points) Sediment input | 0-5 | 0-4 | 0-3 | 0 |
| | 10 | (extensive deposition= 0; little or no sediment = max points) Size & diversity of channel bed substrate | 0 – 5 | 0-4 | 0-4 | 2 |
| | 11 | (fine, homogenous = 0; large, diverse sizes = max points) Evidence of channel incision or widening | NA* | 0-4 | 0-5 | NH |
| LX | 12 | (deeply incised = 0; stable bed & banks = max points) Presence of major bank failures | 0 – 5 | 0-4 | 0-5 | |
| STABILITY | 13 | (severe erosion = 0; no erosion, stable banks = max points) Root depth and density on banks | 0 – 5 | 0-5 | 0-5 | 3 |
| STA | 14 | (no visible roots = 0; dense roots throughout = max points) Impact by agriculture, livestock, or timber production | 0-3 | 0-4 | 0-5 | 1 |
| | 15 | (substantial impact =0; no evidence = max points) Presence of riffle-pool/ripple-pool complexes | 0-5 | 0-4 | 0-5 | Ì |
| Ţ | 16 | (no riffles/ripples or pools = 0; well-developed = max points) Habitat complexity | 0-3 | 0-5 | 0-6 | |
| HABITAT | 17 | (little or no habitat = 0; frequent, varied habitats = max points) | 0-6 | 0-6 | 0-6 | 2 |
| HA | 18 | (no shading vegetation = 0; continuous canopy = max points) | 0-5 | 0-5 | 0-5 | 1 |
| | 19 | Substrate embeddedness (deeply embedded = 0; loose structure = max) | NA* | 0-4 | 0-4 | MA |
| λí | 20 | Presence of stream invertebrates (see page 4) (no evidence = 0; common, numerous types = max points) | 0-4 | 0-5 | 0-5 | ı |
| BIOLOGY | 21 | Presence of amphibians (no evidence = 0; common, numerous types = max points) | 0-4 | 0-4 | 0-4 | 2 |
| BIO | 22 | (no evidence = 0; common, numerous types = max points) | 0-4 | 0-4 | 0-4 | 0 |
| | 23 | Evidence of wildlife use (no evidence = 0; abundant evidence = max points) | 0-6 | 0-5 | 0-5 | 2 |
| | | Total Points Possible | 100 | 100 | 100 | |
| | | TOTAL SCORE (also enter on first | st page) | | | 23 |

^{*} These characteristics are not assessed in coastal streams.

NC DWQ Stream Identification Form Version 4 11

| Date: 7.10-14 | Project/Site | . Reliability | Latitude: 36° 19'413.56 | | |
|---|----------------------|--|--|--|--|
| Evaluator: DD WEST | County: [+] | | Longitude: 77°38'41.1 Other UNT to Marsh Swa e.g. Quad Name: | | |
| Total Points: Stream is at least intermittent 25.75 | Stream Determi | nation (circle one) ermittent Perennial | | | |
| A Geomorphology (Subset) | | | | | |
| A. Geomorphology (Subtotal = 10) 1a. Continuity of channel bed and bank | Absent | Weak | Moderate | Strong | |
| Sinuosity of channel along thalweg | 0 | 1 | 400 | 3 | |
| 3. In-channel structure: ex. riffle-pool, step-pool, | (0) | 1 | 2 | 3 | |
| ripple-pool sequence | 0 | (1) | 2 | 3 | |
| Particle size of stream substrate | 0 | 71) | | | |
| 5. Active/relict floodplain | 70 | 1 | 2 | 3 | |
| 6. Depositional bars or benches | 0 | (1) | 2 | 3 | |
| 7. Recent alluvial deposits | 0 | | 2 | 3 | |
| 8. Headcuts | 0 | (I) | 2 | 3 | |
| 9. Grade control | 0 | (0.5) | 2 | 3 | |
| 10. Natural valley | 0 | (0.5) | 1 | 1.5 | |
| 11. Second or greater order channel | 1 | = 0 | 1 | 1.5 | |
| artificial ditches are not rated; see discussions in manual | (NO | =0) | Yes = | = 3 | |
| 3. Hydrology (Subtotal = 5) | | | | | |
| 2. Presence of Baseflow | 0 | 1 | | | |
| 3. Iron oxidizing bacteria | | | (2) | 3 | |
| 4. Leaf litter | 0 | | 2 | 3 | |
| Sediment on plants or debris | 1.5 | (1) | 0.5 | 0 | |
| Organic debris lines or piles | 0 | (0.5) | 1 | 1.5 | |
| 7. Soil-based evidence of high water table? | 0 | 0.5 | 0 | 1.5 | |
| C. Biology (Subtotal = 7.25 | No | = 0 | (Yes = | 3) | |
| 8. Fibrous roots in streambed | | | | - Aller - State - Stat | |
| Rooted upland plants in streambed | 3 | 2 | (1) | 0 | |
| | (3) | 2 | 1 | 0 | |
| 20. Macrobenthos (note diversity and abundance) 21. Aquatic Mollusks | 0 | 1 | 2 | 3 | |
| 22. Fish | Q | 1 | 2 | 3 | |
| 3. Crayfish | (0) | 0.5 | 1 | 1.5 | |
| 4. Amphibians | (0) | 0.5 | 1 | 1.5 | |
| 5. Algae | 0 | 0.5 | (1) | 1.5 | |
| | 0 | | 1 | 1.5 | |
| | | FACW = 0.75; OBL | = 1.5 Other = 0 | | |
| | See p. 35 of manual. | | | | |
| ioles. | | · · · · · · · · · · · · · · · · · · · | | - Was | |
| 6. Wetland plants in streambed *perennial streams may also be identified using other methods. Solotes: shigoo | / / | (0.5) FACW = 0.75; OBL | | 0 | |



SHLG007 – Facing North Up Stream View



SHLG007 – Facing South Down Stream View



SHLG007 – Facing East Cross Stream View

| USACE AID# | DWO# | | · · · · · · · · · · · · · · · · · · · |
|--------------|------|--------|---------------------------------------|
| 00.100111011 | DwQ# | Site # | (indicate on attached map) |
| | | | |

| STREAM QUALITY ASSESSMENT WORKSHEET |
|---|
| Provide the following information for the stream reach under assessment: |
| 1. Applicant's name: Downson 2. Evaluator's name: DDWEST |
| 3. Date of evaluation: 7-10-14 4. Time of evaluation: 8:31 |
| 5. Name of stream: Mached trib to Mach Sur. River basin: Tar-Pamlico |
| 7. Approximate drainage area: 750 Acres 8. Stream order: |
| 9. Length of reach evaluated: 50 5 + 10. County: Jan Liter X |
| 11. Site coordinates (if known): prefer in decimal degrees. 12. Subdivision name (if any): |
| Latitude (ex. 34.872312): 36 19 42.651" Longitude (ex77.556611): 77°38' 41.980" |
| Method location determined (circle): GPS Topo Sheet Ortho (Aerial) Photo/GIS Other GIS Other |
| 13. Location of reach under evaluation (note nearby roads and landmarks and attach map identifying stream(s) location): |
| Directly adjinent to Gregory Lone (roadside Ditch) 14. Proposed channel work (if any): Done |
| 15. Recent weather conditions: Mainly Ory - Sew showers |
| 16. Site conditions at time of visit: Normal |
| 17. Identify any special waterway classifications known: NA Section 10 NA Tidal Waters NEssential Fisheries Habitat |
| Whatout Waters Whoutstanding Resource Waters Whoutrient Sensitive Waters Water Supply Watershed WH(I-IV) |
| 18. Is there a pond or lake located upstream of the evaluation point? YES NO If yes, estimate the water surface area: |
| 19. Does channel appear on USGS quad map? YES (NO) 20. Does channel appear on USDA Soil Survey? YES (NO) |
| 21. Estimated watershed land use:% Residential% Commercial% Industrial% Agricultural |
| Cleared / Logged % Other () |
| 22. Bankfull width: 23. Bank height (from bed to top of bank): |
| 24. Channel slope down center of stream: Flat (0 to 2%)Gentle (2 to 4%)Moderate (4 to 10%)Steep (>10%) |
| 25. Channel sinuosity: StraightOccasional bendsFrequent meanderVery sinuousBraided channel |
| Instructions for completion of worksheet (located on page 2): Begin by determining the most appropriate ecoregion based on location, terrain, vegetation, stream classification, etc. Every characteristic must be scored using the same ecoregion. Assign points to each characteristic within the range shown for the ecoregion. Page 3 provides a brief description of how to review the characteristics identified in the worksheet. Scores should reflect an overall assessment of the stream reach under evaluation. If a characteristic cannot be evaluated due to site or weather conditions, enter 0 in the scoring box and provide an explanation in the comment section. Where there are obvious changes in the character of a stream under review (e.g., the stream flows from a pasture into a forest), the stream may be divided into smaller reaches that display more continuity, and a separate form used to evaluate each reach. The total score assigned to a stream reach must range between 0 and 100, with a score of 100 representing a stream of the highest quality. |
| Total Score (from reverse): 2 Comments: Monmade roadside ditch lending from a west and and empty registo intermitted ditch which then lends to Warsh Swamp |
| Evaluator's Signature Date 7-(0-2014) This channel evaluation form is intended to be used only as a guide to assist landowners and environmental professionals in |

This channel evaluation form is intended to be used only as a guide to assist landowners and environmental professionals in gathering the data required by the United States Army Corps of Engineers to make a preliminary assessment of stream quality. The total score resulting from the completion of this form is subject to USACE approval and does not imply a particular mitigation ratio or requirement. Form subject to change – version 06/03. To Comment, please call 919-876-8441 x 26.

STREAM QUALITY ASSESSMENT WORKSHEET SHILL COS



| # | | CHARACTERISTICS | ECOREGION POINT RANGE | | | SCORE |
|-------------------|---------|--|-----------------------|----------|----------|-------|
| | | Presence of flow / war it do | Coastal | Piedmont | Mountain | SCORE |
| | 1 | Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points) | 0-5 | 0-4 | 0-5 | |
| | 2 | Evidence of past human alteration (extensive alteration = 0; no alteration = max points) | 0-6 | 0-5 | 0-5 | 1 |
| | 3 | Riparian zone (no buffer = 0; contiguous, wide buffer = max points) | 0-6 | 0-4 | 0-5 | 1 |
| | 4 | Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points) | 0-5 | 0-4 | 0-4 | 1 |
| CAL | 5 | Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points) | 0-3 | 0-4 | 0-4 | 0 |
| PHYSICAL | 6 | Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points) | 0-4 | 0-4 | 0-2 | 7) |
| PH | 7 | Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points) | 0-5 | 0-4 | 0-2 | 1 |
| | 8 | Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points) | 0-6 | 0-4 | 0-2 | 7) |
| | 9 | Channel sinuosity (extensive channelization = 0; natural meander = max points) | 0-5 | 0-4 | 0-3 | 0 |
| | 10 | Sediment input (extensive deposition= 0; little or no sediment = max points) | 0-5 | 0-4 | 0-4 | 1 |
| | -11 | Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points) | NA* | 0-4 | 0-5 | NA |
| J. | 12 | Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points) | 0-5 | 0-4 | 0 – 5 | 4 |
| ILI | 13 | Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points) | 0-5 | 0-5 | 0-5 | 4 |
| STABILITY | 14 | Root depth and density on banks (no visible roots = 0; dense roots throughout = max points) | 0-3 | 0-4 | 0-5 | 2 |
| S | 15 | Impact by agriculture, livestock, or timber production (substantial impact =0; no evidence = max points) | 0-5 | 0-4 | 0-5 | 1 |
| L | 16 | Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points) | 0-3 | 0-5 | 0-6 | 0 |
| HABITAT | 17 | Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points) | 0-6 | 0-6 | 0-6 | 1 |
| HAB | 18 | Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points) | 0-5 | 0-5 | 0-5 | 1864 |
| | 19 | Substrate embeddedness (deeply embedded = 0; loose structure = max) | NA* | 0-4 | 0-4 | NA |
| Y | 20 | Presence of stream invertebrates (see page 4) (no evidence = 0; common, numerous types = max points) | 0-4 | 0-5 | 0-5 | 0 |
| 90 | 21 | Presence of amphibians (no evidence = 0; common, numerous types = max points) | 0-4 | 0-4 | 0-4 | 1 |
| BIOLOGY | 22 | Presence of fish (no evidence = 0; common, numerous types = max points) | 0-4 | 0-4 | 0-4 | Ò |
| | 23 | Evidence of wildlife use (no evidence = 0; abundant evidence = max points) | 0-6 | 0-5 | 0-5 | 1 |
| 000 000 000 | | Total Points Possible | 100 | 100 | 100 | • |
| | | TOTAL SCORE (also enter on firs | st page) | | | 71 |
| * T | nese ch | naracteristics are not assessed in coastal streams. | 1 0 / | | | 1 |

These characteristics are not assessed in coastal streams.

5HL6 DOB

Latitude: 36°/9′4/2.651

Longitude: 77°38′41.98 NC DWQ Stream Identification Form Version 4.11 Date: Project/Site: Se Reliability Evaluator: County: **Total Points:** Other UNT to Marsh Swam Stream Determination (circle one) Stream is at least intermittent Ephemeral Intermittent Perennial if ≥ 19 or perennial if ≥ 30* e.g. Quad Name: A. Geomorphology (Subtotal = -Weak Absent Moderate Strong 1a. Continuity of channel bed and bank 1 2 3 2. Sinuosity of channel along thalweg 0 2 3 3. In-channel structure: ex. riffle-pool, step-pool, 0 2 3 ripple-pool sequence 4. Particle size of stream substrate 1 2 3 5. Active/relict floodplain 2 3 6. Depositional bars or benches 1 2 3 7. Recent alluvial deposits 1 2 3 8. Headcuts 2 3 9. Grade control 0 0.5 1 1.5 10. Natural valley 0.5 1 1.5 11. Second or greater order channel No = 0Yes = 3artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = 12. Presence of Baseflow 0 2 3 13. Iron oxidizing bacteria 0 1 3 14. Leaf litter 1.5 0.5 0 15. Sediment on plants or debris 0 0.5 1.5 16. Organic debris lines or piles 0 1 1.5 17. Soil-based evidence of high water table? No = 0Yes = 3 C. Biology (Subtotal = 18. Fibrous roots in streambed 3 2 0 19. Rooted upland plants in streambed 3 2 0 20. Macrobenthos (note diversity and abundance) 0 1 2 3 21. Aquatic Mollusks 0 1 2 3 22. Fish 0 0.5 1 1.5 23. Crayfish 10 0.5 1 1.5 24. Amphibians 0 0.5 1 1.5 25. Algae (0) 0.5 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:

shlg008



SHLG008 – Facing East Up Stream View



SHLG008 – Facing West Down Stream View



SHLG008 – Facing North Cross Stream View

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Site #____ (indicate on attached map)

HAH



| Provide the following information for the stream reach un | der assessment: |
|--|---|
| 1. Applicant's name: Dominion | 2. Evaluator's name: DOCOEST |
| 3. Date of evaluation: 7-10-14 | 4. Time of evaluation: |
| 5. Name of stream: una Amed trib & Marsh & | Tar-Pamlico |
| 7. Approximate drainage area: 7 100 UCNES | 8. Stream order: |
| 9. Length of reach evaluated: | 10. County: Halifax |
| 11. Site coordinates (if known): prefer in decimal degrees. | 12. Subdivision name (if any): |
| Latitude (ex. 34.872312): 36° 19° 26.000 | Longitude (ex77.556611): 77°38'49, 835 |
| Method location determined (circle): GPS Topo Sheet Ortho (13. Location of reach under evaluation (note nearby roads and | (Agrial) Photo/GIS Other GIS Other |
| OFF OF Gregory lane | , |
| 14. Proposed channel work (if any): None | |
| 15. Recent weather conditions: Mainly dry | |
| 16. Site conditions at time of visit: Worman | |
| 17. Identify any special waterway classifications known: 17. | Section 10 WHTidal Waters LESsential Fisheries Habitat Nutrient Sensitive Waters Water Supply Watershed WH(I-IV) |
| 18. Is there a nond or lake located unctroom of the angle of | Nutrient Sensitive Waters Water Supply Watershed WK (I-IV) |
| 18. Is there a pond or lake located upstream of the evaluation p19. Does channel appear on USGS quad map? (YES) NO | |
| expetit para du per esta esta esta esta esta esta esta esta | 20. Does channel appear on USDA Soil Survey? (YES) NO |
| | % Commercial% Industrial% Agricultural |
| 22 Double 11 - 141 | % Cleared / Logged% Other (|
| EDITATE DE CONTROL DE PORTO DE COMPLICIO DE PARTE DE CONTROL DE CO | 23. Bank height (from bed to top of bank): |
| 25. Channel sinuscity: X Straight Constitution 1 | Gentle (2 to 4%)Moderate (4 to 10%)Steep (>10%) |
| Instructions for completion of small bands | Frequent meanderVery sinuousBraided channel |
| to each characteristic within the range shown for the ecor characteristics identified in the worksheet. Scores should ref characteristic cannot be evaluated due to site or weather con- comment section. Where there are obvious changes in the cha- into a forest), the stream may be divided into smaller reaches t | e 2): Begin by determining the most appropriate ecoregion based on characteristic must be scored using the same ecoregion. Assign points region. Page 3 provides a brief description of how to review the lect an overall assessment of the stream reach under evaluation. If a ditions, enter 0 in the scoring box and provide an explanation in the aracter of a stream under review (e.g., the stream flows from a pasture that display more continuity, and a separate form used to evaluate each between 0 and 100, with a score of 100 representing a stream of the |
| Total Score (from reverse): Commen | ts: Man-made Conal |
| | |
| | |
| Evaluator's Signature | Date |
| quality. The total score resulting from the completion of | s a guide to assist landowners and environmental professionals in Corps of Engineers to make a preliminary assessment of stream this form is subject to USACE approval and does not imply a change – version 06/03. To Comment, please call 919-876-8441 x 26. |

| | # | CHADACTEDICATO | ECOREC | GION POIN | FRANCE | |
|------------|---------|--|---------|-------------------|----------|-------|
| | " | CHARACTERISTICS | Coastal | Piedmont | Mountain | SCORE |
| | 1 | Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points) | 0-5 | 0-4 | 0 – 5 | 4 |
| | 2 | Evidence of past human alteration (extensive alteration = 0; no alteration = max points) | 0-6 | 0-5 | 0-5 | |
| | 3 | Riparian zone (no buffer = 0; contiguous, wide buffer = max points) | 0-6 | 0-4 | 0-5 | i |
| | 4 | Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points) | 0 – 5 | 0-4 | 0-4 | |
| PHYSICAL | 5 | Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points) | 0-3 | 0-4 | 0-4 | 7_ |
| IXSI | 6 | Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points) | 0-4 | 0-4 | 0-2 | 0 |
| PE | 7 | Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points) | 0-5 | 0-4 | 0-2 | 1 |
| | 8 | Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points) | 0-6 | 0-4 | 0-2 | 0 |
| | 9 | Channel sinuosity (extensive channelization = 0; natural meander = max points) | 0-5 | 0-4 | 0-3 | 0 |
| - Em | 10 | (extensive deposition= 0; little or no sediment = max points) | 0-5 | 0-4 | 0-4 | 2 |
| | 11 | Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points) | NA* | 0-4 | 0-5 | NA |
| LX | 12 | Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points) | 0-5 | 0-4 | 0-5 | 1 |
| HLT | 13 | Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points) | 0-5 | 0-5 | 0-5 | 4 |
| STABILITY | 14 | Root depth and density on banks (no visible roots = 0; dense roots throughout = max points) | 0-3 | 0-4 | 0-5 | 2 |
| Ø 2 | 15 | Impact by agriculture, livestock, or timber production (substantial impact =0; no evidence = max points) | 0 – 5 | 0-4 | 0-5 | 1 |
| L | 16 | Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points) | 0-3 | 0-5 | 0-6 | 1 |
| ITA | 17 | Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points) | 0-6 | 0-6 | 0-6 | 2 |
| HABITAT | 18 | Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points) | 0-5 | 0-5 | 0-5 | 1 |
| | 19 | Substrate embeddedness (deeply embedded = 0; loose structure = max) | NA* | 0-4 | 0-4 | MA |
| 7 | 20 | Presence of stream invertebrates (see page 4) (no evidence = 0; common, numerous types = max points) | 0-4 | 0-5 | 0-5 | 1 |
| 507 | 21 | (no evidence = 0; common, numerous types = max points) | 0-4 | 0-4 | 0-4 | 3 |
| BIOLOGY | 22 | Presence of fish (no evidence = 0; common, numerous types = max points) | 0-4 | 0-4 | 0-4 | D |
| | 23 | Evidence of wildlife use (no evidence = 0; abundant evidence = max points) | 0-6 | 0-5 | 0-5 | 2 |
| | | Total Points Possible | 100 | 100 | 100 | |
| | | TOTAL SCORE (also enter on firs | t page) | The second second | | 30 |
| * TI | nese ch | aracteristics are not assessed in coastal streams. | | | | |

These characteristics are not assessed in coastal streams.

| Date: 7~10~14 | Project/Site: | chability | Latitude: 7/0 | 19'21 507 |
|---|----------------------------------|--|---|---------------|
| Evaluator: DDWEST | County: | ulibax | Latitude: 36°/6'26.000 Longitude: 77°38'49.8 | |
| Total Points: Stream is at least intermittent if \geq 19 or perennial if \geq 30* | Stream Determi Ephemeral Inte | ination (circle one) ermittent (Perennia) | | Marsh Swam |
| A. Geomorphology (Subtotal = 7. 5) | Absent | Weak | Moderate | Strong |
| 1 ^a Continuity of channel bed and bank | Q | 1 | 2 | (3) |
| Sinuosity of channel along thalweg | (0) | 1 | 2 | 3 |
| 3. In-channel structure: ex. riffle-pool, step-pool, | 0 | | | |
| ripple-pool sequence | | | 2 | 3 |
| 4. Particle size of stream substrate | 0 | 1) | 2 | 3 |
| 5. Active/relict floodplain | (0) | 1 | 2 | 3 |
| 6. Depositional bars or benches | 70 | 0 | 2 | 3 |
| 7. Recent alluvial deposits | 0 | 1 | 2 | 3 |
| 8. Headcuts | 0 | 1 | 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 | 0 = 0 | Yes = | : 3 |
| artificial ditches are not rated; see discussions in manual | | manufacture and the second sec | | |
| B. Hydrology (Subtotal =/ 🛴) | | | | |
| 12. Presence of Baseflow | 0 | 1 | 2 | (3) |
| 13. Iron oxidizing bacteria | 0 | 1 | 2 | |
| 14. Leaf litter | 1.5 | (1) | Willex a | (3) |
| 15. Sediment on plants or debris | 0 | 0.5 | Sept . | |
| 16. Organic debris lines or piles | 0 | 0.5 | (1) | 1.5 |
| 17. Soil-based evidence of high water table? | L | = 0 | (Ves = | 1.5 |
| C. Biology (Subtotal = 17), S) | | | (res - | 3) |
| 18. Fibrous roots in streambed | 3 | (2) | | |
| 9. Rooted upland plants in streambed | (3) | (2) | 1 | 0 |
| 20. Macrobenthos (note diversity and abundance) | 1 3 | | 1 | 0 |
| 21. Aquatic Mollusks | (6) | (1) | 2 | 3 |
| 22. Fish | | 1.600 | 2 | 3 |
| 23. Crayfish | 0 | | 1 | 1.5 |
| 24. Amphibians | | | $ \bigcirc$ \bigcirc \bigcirc | |
| 25. Algae | 0 | 0.5 | 1 | (1.5) |
| 26. Wetland plants in streambed | 0 1 | (0.5') | 1 | 1.5 |
| *perennial streams may also be identified using other methods. | 0 | FACW = 0.75; ØBL | = 1.5 Other = 0 | |
| Notes: | See p. 35 of manual. | | | |
| 10003. | | | | |
| | /shlg(| 009 | - | _ |



SHLG009 – Facing West Up Stream View



SHLG009 – Facing East Down Stream View



SHLG009 – Facing North Cross Stream View

NC Division of Water Quality –Methodology for Identification of Intermittent and Perennial Streams and Their Origins v. 4.11

NC DWQ Stream Identification Form Version 4.11

| Date: 8/10/15 | Project/Site: Dominion ACP | Latitude: 36.323444 |
|--|--|--------------------------|
| Evaluator: TODD Preuninger | County: Halifax | Longitude: -77.648785 |
| Total Points: Stream is at least intermittent 35.5 (sec if ≥ 19 or perennial if ≥ 30* | Stream Determination (circle one) Ephemeral Intermittent Perennia | Other e.g. Quad Name: |

| A. Geomorphology (Subtotal = (o) | Absent | Weak | Moderate | Strong |
|--|----------------------|---------|---------------------|------------|
| 1a. Continuity of channel bed and bank - Dug Canal | 0 | 1 | 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 | 2 | 3 |
| 5. Active/relict floodplain | 0 | 1 | 2 | 3 |
| Depositional bars or benches | 0 | 1 | 2 | 3 |
| 7. Recent alluvial deposits | 0 | 1 | 2 | 3 |
| 3. Headcuts | 0 | (1) | 2 | 3 |
| 9. Grade control | (6) | 0.5 | 1 | 1.5 |
| Natural valley | 0 | 0.5 | 1 | 1.5 |
| Second or greater order channel | (No | = 0 | Yes: | = 3 |
| artificial ditches are not rated; see discussions in manual | | | Stee | t of stari |
| B. Hydrology (Subtotal = 2.5) | | | | |
| 12. Presence of Baseflow | 0 | 1 | 2 | (3) |
| 13. Iron oxidizing bacteria | (2) | 1 | 2 | 3 |
| 14. Leaf litter | (1.5) | 1 | 0.5 | 0 |
| 5. Sediment on plants or debris | 0 | 0.5 | 0 | 1.5 |
| 6. Organic debris lines or piles | 0 | 0.5 | 0 | 1.5 |
| 7. Soil-based evidence of high water table? | No | = 0 | (Yes | |
| C. Biology (Subtotal = \O) | - | | | |
| 8. Fibrous roots in streambed | (3) | 2 | 1 1 | 0 |
| 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 | 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 |
| 26. Wetland plants in streambed | , 1 | | OBL = 1.5 Other = 0 | |
| *perennial streams may also be identified using other methods. § | See p. 35 of manual. | | 7.0 Other = 0 | |
| | | | 11. ~ cl .f | 7 |
| Notes: 12' wide of airage canal dua is | Elala 3 | 77 | E101. 7 11 W | in (er) |
| 7 | D- 21 | - Sware | | |
| Sketch: Observed from STE Cotton PP PP PP PP PP PP PP PP PP | 67 | | | |
| Reich. | 3/ | | G. | |
| 10 PP | 1/ | | | |
| (Y X | | | | |
| 6/2/ | V | | | |
| ^ | SHLB 050 | | | |
| 1 * | A.1 | | | |





| Provid | e th | ie fo | ollowin | g inf | formation | for the | stream | reach | under | assessment: |
|--------|------|-------|---------|-------|-----------|---------|--------|-------|-------|-------------|
|--------|------|-------|---------|-------|-----------|---------|--------|-------|-------|-------------|

| 1. Applicant's name: Dominion - ACP | 2. Evaluator's name: TODD Preuninger |
|--|--|
| 3. Date of evaluation: \[\frac{9}{10/15} \] | 4. Time of evaluation: AND |
| 5. Name of stream: SHLBOSO- | 6. River basin: Tar-Pam |
| 7. Approximate drainage area: | 8. Stream order: \\ \frac{5+}{} |
| 9. Length of reach evaluated: 300' | 10. County: Halifax |
| 11. Site coordinates (if known): prefer in decimal degrees. | 12. Subdivision name (if any): |
| Latitude (ex. 34.872312): 36.323444 Method location determined (circle): GPS Topo Sheet Ortho | Longitude (ex. –77.556611): -77.648785 |
| 13. Location of reach under evaluation (note nearby roads and | Tandmarks and attach map identifying stream(s) location): |
| ~ 1000 feet south of the intersection | Un of Grapevine Rd + JS Pape Road |
| 14. Proposed channel work (if any): | |
| 15. Recent weather conditions: No rain in last 48 | |
| 16. Site conditions at time of visit: () = 3 - 3 - 7 8 ° | |
| | Section 10Tidal WatersEssential Fisheries Habitat |
| | Nutrient Sensitive WatersWater Supply Watershed(I-IV) |
| | point? YES NO If yes, estimate the water surface area: |
| 19. Does channel appear on USGS quad map? YES NO | 20. Does channel appear on USDA Soil Survey? YES NO |
| 21. Estimated watershed land use: % Residential | % Commercial% Industrial% Agricultural |
| <u></u> \$\sqrt{5}\sqrt{8} Forested | % Cleared / Logged% Other () |
| 22. Bankfull width: \ \lambda \' | 23. Bank height (from bed to top of bank): 🙎 |
| 24. Channel slope down center of stream:Flat (0 to 2%) | Gentle (2 to 4%)Moderate (4 to 10%)Steep (>10%) |
| 25. Channel sinuosity:StraightOccasional bends | Frequent meanderVery sinuousBraided channel |
| location, terrain, vegetation, stream classification, etc. Every to each characteristic within the range shown for the eco characteristics identified in the worksheet. Scores should re characteristic cannot be evaluated due to site or weather concomment section. Where there are obvious changes in the chinto a forest), the stream may be divided into smaller reaches | ge 2): Begin by determining the most appropriate ecoregion based on characteristic must be scored using the same ecoregion. Assign points pregion. Page 3 provides a brief description of how to review the effect an overall assessment of the stream reach under evaluation. If a miditions, enter 0 in the scoring box and provide an explanation in the paracter of a stream under review (e.g., the stream flows from a pasture that display more continuity, and a separate form used to evaluate each the between 0 and 100, with a score of 100 representing a stream of the |
| Total Score (from reverse): 27 Comme | nts: Draineas canal dua between agricultura Was feet Gleep. Observed frogs, fish & |
| Evaluator's Signature | Date 8 10 15 as a guide to assist landowners and environmental professionals in |
| gathering the data required by the United States Army | as a guide to assist landowners and environmental professionals in Corps of Engineers to make a preliminary assessment of stream of this form is subject to USACE approval and does not imply a |

particular mitigation ratio or requirement. Form subject to change – version 06/03. To Comment, please call 919-876-8441 x 26.

| | H. | CHARACTERISTICS | English | 1(2)842(0)124 1(2)842(0)124 | RANGE Mountain | अङ्गारीहर |
|-----------|----|--|--------------|--------------------------------|-------------------|-----------|
| | 1 | Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points) | 0-5 | 0-4 | 0-5 | 3 |
| | 2 | Evidence of past human alteration (extensive alteration = 0; no alteration = max points) | 0-6 | 0-5 | 0-5 | ١ |
| | 3 | Riparian zone (no buffer = 0; contiguous, wide buffer = max points) | 0-6 | 0-4 | 0-5 | 0 |
| | 4 | Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points) | 0-5 | 0-4 | 0-4 | 3 |
| 4 | 5 | Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points) | 0-3 | 0-4 | 0-4 | ١ |
| PERVSICAL | 6 | Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points) | 0-4 | 0-4 | 0-2 | 0 |
| H | 7 | Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points) | 0-5 | 0-4 | 0-2 | \ |
| | 8 | Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points) | 0-6 | 0-4 | 0-2 | 0 |
| | 9 | Channel sinuosity (extensive channelization = 0; natural meander = max points) | 0-5 | 0-4 | 0-3 | 0 |
| | 10 | Sediment input (extensive deposition= 0; little or no sediment = max points) | 0-5 | 0-4 | 0-4 | |
| | 11 | Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points) | NA* | 0-4 | 0 – 5 | 1 |
| احد | 12 | Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points) | 0-5 | 0-4 | 0-5 | 2 |
| | 13 | Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points) | 0-5 | 0-5 | 0-5 | 7 |
| STABIL | 14 | Root depth and density on banks `(no visible roots = 0; dense roots throughout = max points) | 0 + 3 | 0-4 | 0-5 | 1 |
| Ø | 15 | Impact by agriculture, livestock, or timber production (substantial impact =0; no evidence = max points) | 0-5 | 0-4 | 0 – 5 | 0 |
| | 16 | Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points) | 0-3 | 0-5 | 0-6 | 0 |
| BITAT | 17 | Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points) | 0-6 | 0-6 | 0-6 | 1 |
| ELAB | 18 | Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points) | 0-5 | 0-5 | 0-5 | 0 |
| | 19 | Substrate embeddedness (deeply embedded = 0; loose structure = max) | ·_NAt | 0-4 | 0-4 | ı |
| أدا | 20 | Presence of stream invertebrates (see page 4) (no evidence = 0; common, numerous types = max points) | 0-4 | 0-5 | 0-5 | 1 |
| 7.50° | 21 | Presence of amphibians (no evidence = 0; common, numerous types = max points) | 0-4 | 0-4 | 0-4 | a |
| 9 | 22 | Presence of fish (no evidence = 0; common, numerous types = max points) | 0-4 | 0-4 | 0 - 4 | 2 |
| | 23 | Evidence of wildlife use (no evidence = 0; abundant evidence = max points) | 0-6 | 0-5 | 0-5 | 2 |
| | | Total Points Possible | 100 | \$ 160°. | 100 | |
| C) | | TOTAL SCORE (also enter on f | irst page) 🐰 | | | 27 |

^{*} These characteristics are not assessed in coastal streams.



Waterbody SHLB050 facing west upstream



Waterbody SHLB050 facing south downstream



Waterbody SHLB050 facing southwest across

| USACE AID# | DWQ # | Site # | (indicate on attached map |
|------------|-------|--------|---------------------------|

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|---|---|----|---|---|---|
| B | 1 | ť. | ı | Ц | |
| B | 1 | 11 | | d | |



Provide the following information for the stream reach under assessment: minvon 2. Evaluator's name: 1. Applicant's name: 4. Time of evaluation: 3. Date of evaluation: 6. River basin: 5. Name of stream: M 7. Approximate drainage area: 8. Stream order: 10. County: 9. Length of reach evaluated: 11. Site coordinates (if known): prefer in decimal degrees. 12. Subdivision name (if any): Latitude (ex. 34.872312):36° 18' 20.181 Longitude (ex. -77.556611): 77 Method location determined (circle): GPS Topo Sheet Ortho (Aerial) Photo/GIS Other GIS Other 13. Location of reach under evaluation (note nearby roads and landmarks and attach map identifying stream(s) location): NONCO 14. Proposed channel work (if any):_ 15. Recent weather conditions: 16. Site conditions at time of visit: LATidal Waters MA Essential Fisheries Habitat 17. Identify any special waterway classifications known: WE section 10 Maters Moutstanding Resource Waters Nutrient Sensitive Water Supply Watershed Nutrient Sensitive Water Supply Wat 18. Is there a pond or lake located upstream of the evaluation point? YES (NO) If yes, estimate the water surface area:_ 20. Does channel appear on USDA Soil Survey? (YES) NO 19. Does channel appear on USGS quad map? (YES) NO 60% Agricultural % Industrial % Commercial 21. Estimated watershed land use: ✓% Residential _% Cleared / Logged ____% Other (_ 23. Bank height (from bed to top of bank):___ 22. Bankfull width: 24. Channel slope down center of stream: Flat (0 to 2%) ___Gentle (2 to 4%) ___Moderate (4 to 10%) ___Steep (>10%) 25. Channel sinuosity: ____Straight ____Occasional bends ____Frequent meander Braided channel Very sinuous Instructions for completion of worksheet (located on page 2): Begin by determining the most appropriate ecoregion based on location, terrain, vegetation, stream classification, etc. Every characteristic must be scored using the same ecoregion. Assign points to each characteristic within the range shown for the ecoregion. Page 3 provides a brief description of how to review the characteristics identified in the worksheet. Scores should reflect an overall assessment of the stream reach under evaluation. If a characteristic cannot be evaluated due to site or weather conditions, enter 0 in the scoring box and provide an explanation in the comment section. Where there are obvious changes in the character of a stream under review (e.g., the stream flows from a pasture into a forest), the stream may be divided into smaller reaches that display more continuity, and a separate form used to evaluate each reach. The total score assigned to a stream reach must range between 0 and 100, with a score of 100 representing a stream of the highest quality. Total Score (from reverse): Comments: Date Evaluator's Signature This channel evaluation form is intended to be used only as a guide to assist landowners and environmental professionals in gathering the data required by the United States Army Corps of Engineers to make a preliminary assessment of stream quality. The total score resulting from the completion of this form is subject to USACE approval and does not imply a particular mitigation ratio or requirement. Form subject to change - version 06/03. To Comment, please call 919-876-8441 x 26.

| | ,, [| GWADA CEEDYCEYCC | CHARACTERISTICS ECOREGION POINT RANG | | RANGE | SCORE |
|-----------|-----------------------|--|--------------------------------------|----------|----------|----------|
| | # | CHARACTERISTICS | Coastal | Piedmont | Mountain | SCORE |
| | 1 | Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points) | 0-5 | 0-4 | 0-5 | 5 |
| | 2 | Evidence of past human alteration (extensive alteration = 0; no alteration = max points) | 0-6 | 0 – 5 | 0 – 5 | 4 |
| | 3 | Riparian zone (no buffer = 0; contiguous, wide buffer = max points) | 0-6 | 0-4 | 0-5 | 84 |
| | 4 | Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points) | 0-5 | 0-4 | 0-4 | 4 |
| 1 | Grandwitten die beweg | | 0-3 | 0-4 | 0-4 | 3 |
| LUISICAL | | | 0 – 4 | 0-4 | 0-2 | 1 |
| | 7 | Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points) | 0-5 | 0-4 | 0-2 | 5 |
| | 8 | Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points) | 0-6 | 0-4 | 0 – 2 | 6 |
| | 9 | Channel sinuosity (extensive channelization = 0; natural meander = max points) | 0-5 | 0-4 | 0-3 | 2 |
| | 10 | (extensive deposition= 0; little or no sediment = max points) | | 0-4 | 0-4 | 3 |
| | 11 | Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points) | NA* | 0-4 | 0-5 | NR |
| 4 | 12 | Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points) | 0 – 5 | 0-4 | 0-5 | 14. |
| SIABILITY | 13 | (severe erosion = 0; no erosion, stable banks – max points) | | 0-5 | 0-5 | <u> </u> |
| IAB | 14 | (no visible roots = 0; dense roots throughout = max points) | | 0-4 | 0 – 5 | 12 |
| 2 | 15 | Impact by agriculture livestock or timber production | | 0-4 | 0-5 | 13 |
| | 16 | Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points) | 0-3 | 0-5 | 0-6 | |
| IIAI | 17 | Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points) | 0-6 | 0-6 | 0-6 | 13 |
| HABITAL | 18 | Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points) $0-5$ $0-5$ | | 0-5 | 13 | |
| | 19 | Substrate embeddedness (deeply embedded = 0; loose structure = max) | NA* | 0-4 | 0-4 | NA |
| , | 20 | Presence of stream invertebrates (see page 4) (no evidence = 0; common, numerous types = max points) | 0-4 | 0-5 | 0-5 | 13 |
| 500 | 21 | Presence of amphibians (no evidence = 0; common, numerous types = max points) | 0-4 | 0-4 | 0-4 | 3 |
| BIOLOGY | 22 | Presence of fish (no evidence = 0; common, numerous types = max points) | 0-4 | 0-4 | 0-4 | 12, |
| - | 23 | Evidence of wildlife use (no evidence = 0; abundant evidence = max points) | 0-6 | 0-5 | 0-5 | 14 |
| | | Total Points Possible | 100 | 100 | 100 | |
| | | TOTAL SCORE (also enter on f | irst page) | | | 7 |

^{*} These characteristics are not assessed in coastal streams.

SHLH -008 NC DWQ Stream Identification Form Version 4.11 Latitude: 7/8 Reliabolos Date: Project/Site: Longitude: Evaluator: County: | **Total Points:** Other Marsh Swamp Stream Determination (circle one) 38.5 Stream is at least intermittent Ephemeral Intermittent Perennial e.g. Quad Name: if ≥ 19 or perennial if ≥ 30* Moderate Strong Weak Absent A. Geomorphology (Subtotal = (3 2 1a. Continuity of channel bed and bank 0 0 1 2 3 2. Sinuosity of channel along thalweg 3. In-channel structure: ex. riffle-pool, step-pool, 2 3 0 1 ripple-pool sequence 2 3 0 1 4. Particle size of stream substrate (3 2 0 5. Active/relict floodplain 3 0 1 6. Depositional bars or benches 3 2 0 1 7. Recent alluvial deposits 3 0 1 8. Headcuts (4) 1.5 0.5 0 9. Grade control 1.5 0.5 0 10. Natural valley 11. Second or greater order channel No = 0Yes = 3artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = _ 12.5 3 0 1 2 12. Presence of Baseflow 3 2 13. Iron oxidizing bacteria 0 0 1.5 1 0.5 14. Leaf litter 0.5 1 1.5 0 15. Sediment on plants or debris 1.5 0 0.5 16. Organic debris lines or piles Yes = 3 No = 017. Soil-based evidence of high water table? C. Biology (Subtotal = _ __ 13 2 18. Fibrous roots in streambed 3 2 19. Rooted upland plants in streambed 2 1 20. Macrobenthos (note diversity and abundance) 3 0 21. Aquatic Mollusks 1.5 0.5 1 0 22. Fish 1.5 0 0.5 1 23. Crayfish 81.5 0.5 0 24. Amphibians 1.5 0.5 0 25. Algae 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: Porennol stream in middle of tupelo swamp Levet Sketch:

shlh008



SHLH008 – Facing West Up Stream View



SHLH008 – Facing East Down Stream View



SHLH008 – Facing North Cross Stream View

SHLH 007

| USACE AID# | DWO# | Site # | (indicate on attached map) |
|------------|--------|-----------|----------------------------|
| USACE AID# | . DWQ# | _ 0110 11 | (maroure on anarrow |

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| | ١ | 1 | | | ı | P |



| Provide the following information for the stream reach und | er assessment: |
|--|--|
| 1. Applicant's name: Downion | 2. Evaluator's name: |
| 3. Date of evaluation: 7-9-12 | 4. Time of evaluation: |
| | 6. River basin: Occobractor HT-Pam 100 |
| 7. Approximate drainage area: >50 acces | 8. Stream order: 1st (min made sand side |
| 9. Length of reach evaluated: 100 54 | 10. County: HALFRY |
| 11. Site coordinates (if known): prefer in decimal degrees. | 12. Subdivision name (if any): |
| Latitude (ex. 34.872312): 36 18 01.098" | Longitude (ex77.556611): 77°39′5′4. 289° |
| Method location determined (circle): GPS Topo Sheet Ortho (and 13. Location of reach under evaluation (note nearby roads and Directly agreement to Hury 56 | landmarks and attach map identifying stream(s) location): |
| 14. Proposed channel work (if any): | |
| 15. Recent weather conditions: Mainly dry | - few snowers |
| 16. Site conditions at time of visit: Normal | 3.0 %3.0 a.t.0 |
| . 1.d | Section 10 NATidal Waters NA Essential Fisheries Habitat |
| #################################### | Nutrient Sensitive Waters Water Supply Watershed (I-IV) |
| 18. Is there a pond or lake located upstream of the evaluation p | |
| 19. Does channel appear on USGS quad map? YES | 20. Does channel appear on USDA Soil Survey? YES NO |
| | % Commercial% Industrial% Agricultural |
| | % Cleared / Logged% Other () |
| 22. Bankfull width: 5 | 23. Bank height (from bed to top of bank): |
| : [| Gentle (2 to 4%)Moderate (4 to 10%)Steep (>10%) |
| 25. Channel sinuosity: Straight Occasional bends | |
| location, terrain, vegetation, stream classification, etc. Every to each characteristic within the range shown for the eco characteristics identified in the worksheet. Scores should recharacteristic cannot be evaluated due to site or weather cor comment section. Where there are obvious changes in the chinto a forest), the stream may be divided into smaller reaches reach. The total score assigned to a stream reach must range highest quality. | e 2): Begin by determining the most appropriate ecoregion based on characteristic must be scored using the same ecoregion. Assign points region. Page 3 provides a brief description of how to review the flect an overall assessment of the stream reach under evaluation. If a additions, enter 0 in the scoring box and provide an explanation in the aracter of a stream under review (e.g., the stream flows from a pasture that display more continuity, and a separate form used to evaluate each between 0 and 100, with a score of 100 representing a stream of the |
| Total Score (from reverse): Comme | nts: man made voord side ditch |
| | |
| Evaluator's Signature Ark Avecua | Date 7-9-14 |
| This channel evaluation form is intended to be used only | as a guide to assist landowners and environmental professionals in Corps of Engineers to make a preliminary assessment of stream |
| quality. The total score resulting from the completion | of this form is subject to USACE approval and does not imply a change – version 06/03. To Comment, please call 919-876-8441 x 26. |

| | | | ECOREC | GION POINT | Γ RANGE | SCODE |
|-----------|---|--|------------|-------------------------|-------------------------------|-------|
| | # | CHARACTERISTICS | Coastal | Piedmont | Mountain | SCORE |
| | 1 | Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points) | 0-5 | 0-4 | 0-5 | 2 |
| | 2 | Evidence of past human alteration (extensive alteration = 0; no alteration = max points) | 0-6 | 0-5 | 0-5 | 0 |
| Ī | 3 | Riparian zone (no buffer = 0; contiguous, wide buffer = max points) | 0-6 | 0-4 | 0-5 | 0 |
| | 4 Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points) Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points) | | 0-5 | 0-4 | 0-4 | 4 |
| AL | | | 0 – 3 | 0 – 4 | 0-4 | l |
| PHYSICAL | 6 Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points) | | 0 – 4 | 0-4 | 0-2 | 0 |
| | 7 | Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points) | 0 – 5 | 0-4 | 0-2 | L L |
| | 8 | Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points) | 0-6 | 0-4 | 0-2 | 0 |
| | 9 | Channel sinuosity (extensive channelization = 0; natural meander = max points) | 0 – 5 | 0-4 | 0-3 | 0 |
| | 10 | (extensive deposition= 0; little or no sediment = max points) | | 0-4 | 0-4 | 1 |
| | 11 | Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points) | NA* | 0-4 | 0-5 | NA |
| X | 12 | Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points) | 0-5 | 0-4 | 0-5 | 1 |
| | 13 | (severe erosion = 0; no erosion, stable banks - max points) | | 0-5 | 0-5 | 0 |
| STABILITY | 14 | (no visible roots = 0; dense roots throughout - max points) | | 0-4 | 0-5 | l |
| S | 15 | Impact by agricultura livestock or timber production | | 0-4 | 0-5 | i |
| | 16 | Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points) | 0-3 | 0 – 5 | 0-6 | 0 |
| TAT | 17 | Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points) | 0-6 | 0-6 | 0-6 | 1 |
| HABITAT | 18 | Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points) | 0-5 | 0-5 | 0-5 | |
| F | 19 | Substrate embeddedness (deeply embedded = 0; loose structure = max) | NA* | 0-4 | 0-4 | NA |
| 7 | 20 | Presence of stream invertebrates (see page 4) (no evidence = 0; common, numerous types = max points) | 0-4 | 0-5 | 0-5 | 1 |
| OGY | 21 | Presence of amphibians (no evidence = 0; common, numerous types = max points) | 0-4 | 0-4 | 0-4 | 2 |
| BIOLOGY | 22 | Presence of fish (no evidence = 0; common, numerous types = max points) | 0-4 | 0-4 | 0-4 | 0 |
| B | 23 | Evidence of wildlife use (no evidence = 0; abundant evidence = max points) | 0-6 | 0-5 | 0-5 | 1 |
| | | Total Points Possible | 100 | 100 | 100 | |
| | | TOTAL SCORE (also enter on f | irst page) | Security State (Action) | and the state of the state of | 18 |

^{*} These characteristics are not assessed in coastal streams.

NC DWQ Stream Identification Form Version 4.11

SHLH 007

| Date: 79-14 | Project/Site | Reliability | Latitude: ろし | 18,01.00 |
|--|-------------------------|---|--|----------|
| valuator: DUSEST | County: | | | |
| Total Points: Stream is at least intermittent ≥ 19 or perennial if ≥ 30* | Stream Determine | nation (circle one) rmittent Perennial | Other UNT to Marsh St e.g. Quad Name: | |
| A. Geomorphology (Subtotal = 5,5) | Absent | Weak | Moderate | Strong |
| a. Continuity of channel bed and bank | 0 | 1 | (2) | 3 |
| Sinuosity of channel along thalweg | (6) | 1 | 2 | 3 |
| . In-channel structure: ex. riffle-pool, step-pool, | | ① | 2 | 3 |
| ripple-pool sequence | | | | - ASS |
| . Particle size of stream substrate | 0 | (1) | 2 | 3 |
| . Active/relict floodplain | 0 | 1 | 2 | 3 |
| . Depositional bars or benches | (0) | 1 | 2 | 3 |
| . Recent alluvial deposits | 0 | (1) | 2 | 3 |
| 8. Headcuts | 0 | 1 | 2 | 3 |
| . Grade control | 0 | (0.5) | 1 | 1.5 |
| 0. Natural valley | 0 | 0.5 | 1 | 1.5 |
| Second or greater order channel | No | 0 = 0 | Yes = | = 3 |
| artificial ditches are not rated; see discussions in manual | | | | |
| B. Hydrology (Subtotal = 7.5) | | Can Pro | | |
| 2. Presence of Baseflow | 0 | (1) | 2 | 3 |
| 3. Iron oxidizing bacteria | 0 | 1 | (2) | 3 |
| 4. Leaf litter | 1.5 | 1 | (0.5) | 0 |
| 15. Sediment on plants or debris | 0 | (0.5) | 1 | 1.5 |
| 16. Organic debris lines or piles | 0 | (0.5) | 1 / | 1.5 |
| 17. Soil-based evidence of high water table? | No | 0 = 0 | (Yes: | = 3') |
| C. Biology (Subtotal =(1)) | | | | |
| 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) | 0 | 1 | (2) | 3 |
| 21. Aquatic Mollusks | (0) | 1 | 2 | 3 |
| 22. Fish | 0 | 0.5 | 1 | 1.5 |
| 23. Crayfish | (6) | 0.5 | 1 | 1.5 |
| 24. Amphibians | 0 | 0.5 | (1) | 1.5 |
| 25. Algae | (0) | 0.5 | $\overline{}$ | (1.5) |
| 26. Wetland plants in streambed | | FACW = 0.75; OE | BL = 1.5 Other = 0 | |
| *perennial streams may also be identified using other method | ode See n. 35 of manua | | | |
| <u> </u> | ous. See p. 55 of mande | | | |
| Notes: | | | | |
| man-1 | | | | |
| Sketch: | | | | |
| Zondsid . | | | | |
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| sh | lh007 | | | |
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SHLH007 – Facing West Up Stream View



SHLH007 – Facing East Down Stream View

shlh007



SHLH007 – Facing North Cross Stream View

JHL6003

Open Waterbody Data Sheet

| Survey Descrip | tion | | | | | |
|--|-------------------------|----------------------|---|-----------------------|---------------------------------|--|
| Project Name: | | Waterbody | Name: | | Waterbade ID. | 100 |
| Southeastern Re | | | Pord | | Waterbody ID: ohlg003 | Date: 7/23/14 |
| State: | County: | | Company: | Cre | w Member Initials: | Photos: |
| 100 | Halela | 10 | D+D | | 351 | X |
| Tract Number(s): | | | Nearest Milepost: | | Associated Wetland | i ID(s): |
| 18041 | | | 312 | | DHLG | |
| (check one) | ⊠Centerlin | ne 🗆 F | Re-Route | Access Road | Other: | |
| Physical Attribu | ites | | | | | db. |
| Waterbody Type: (check one) Sto | ock Pond Natura | al Pond □ La | ike 🗆 Reservoir 🛱 | [mnoundment] | 704 - 701 | |
| Hydrologic Regime: | | arrond 🗆 La | ike - Reservoir M | impounament | □ Oxbow □ Other: | |
| yarologic Regime. | ∭ Permanently | Flooded | Semipermanently F | looded | asonally Flooded | Temporarily Flooded |
| онwм | OHWM Indi | | | | Journally 1 looded | remporarily Flooded |
| Height: | (check all that a | | Clear line | Shelving | □Wrested | □Scouring □Water |
| _4_f | t. | | on bank | | vegetation | staining |
| | ☐ Ben vegeta | t, matted, or mation | nissing □Wrack line | □ Litter and | | Soil characteristic change |
| Depth of Water: | | | 1000 F | debris | community cha | ange |
| Deptir of Water: | 1 . | Bank heig | ht (average): | | Bank slope (aver | age): |
| N/A 🗆 | ft. | | ft | | _ | degrees |
| | | | | | | |
| Qualitative Attrib | outes | | | | | |
| Water Appearance: | | | | | | |
| (check one) | □No water □ | Clear | | | □Algal □0 mats | Other: |
| Substrate: | ☐ Bedrock ☐ Be | oulder 🗆 Co | obble | ⊠ Sand □ S | ilt/ clay Organic | |
| (check all that apply) | | | ocoic Clavel | A Salid 14/S | ilt/ clay Organic | ☐ Other: |
| % of Substrate: | % | % | %% | 30 % 60 | % 10 % | % |
| Width of Riparian Zo | ne: Vegetative | Layers: | | | | |
| >10 ft. | (check all that | - | .™.Trees: | ∄ Sa | plings/Shrubs: | ÀHerbs |
| E-735 III | Ava. DBH | of Dominants | . 8 in | 2 | | ELITO O |
| V/A 🗆 | (approx.) | o. Dominants | •in. | | in. | in. |
| Dominant Bank Vege | | | | - U | | |
| Queens phallos | s, Liquidadas | streakle | L, Ilex ope | · Ca | | |
| Aquatic Habitats (ex. s | submerged or emerged aq | uatic vegetation, ov | verhanging banks/roots, leaf | packs large submerge | d wood, riffles, deep pools, et | |
| Pand m | // 1/ | - / | 3 | poons, raige soomerge | o wood, miles, deep pools, et | C.); |
| Aquatic Organisms O | noll, duck | nneed | | | | |
| and the same of th | | | | | | |
| | , furtles | | | | | |
| &E Species Observe | ed (list): | | | | | |
| ** | | | | | | |
| Disturbances (ex: lives | stock access, manure in | n waterbody, wa | ste discharge pipes): | | | |
| | tode acce | | | | | |
| Vaterbody is: | | en sp | | | | |
| check one) | ☐ Natural | Artificial | , man-made □ N | Manipulated | | |
| Vaterbody Quality a: | | , | | na iipulateu | | |
| check one) | ☐ High | ☐ Moderate | Low | Ŋ. | | |
| | . //9/1 | oddrate | EJ-LUW | | | the second secon |

Waterbody ID:

ohlg003

High Quality: Natural, natural bank vegetation around entire waterbody; banks stable and protected by roots; water color is clear to tea-colored; no barriers to fish movement; many fish cover types available; diverse and stable aquatic habitat; no disturbance by livestock or man.

Moderate Quality: Altered by rip-rap; natural vegetation extends 1/3-1/2 of the active channel width on each side; filtering function or bank vegetation only moderately compromised; banks moderately unstable; water color is cloudy, submerged objects covered with greenish film; moderate odor; minor barriers to fish movement; fair aquatic habitat; minimum disturbance by livestock or man.

Low Quality: Rip rap and channelization excessive; natural vegetation less than 1/3 of the active channel width on each side; lack of regeneration; filtering function severely compromised; banks unstable (eroding); water color is muddy and turbid; obvious pollutants (algal mats, surface scum, surface sheen); heavy odor; severe barriers to fish movement; little to no aquatic habitat; severe disturbance from livestock or man.

Notes:

Form pard. Found observed on worker surface.

Waterbody Sketch (Include north arrow, centerline distance from centerline, data point locations, survey boundary, and IDs of associated features)



ohlg003



Open water ohlg003 facing north



Open water ohlg003 facing west

| shlh019 | |
|---------|--|

| TIO LOD LID !! | | | |
|--|-----------|--|----------------------------|
| USACE AID# | _ DWO# | 0:4- # | C 1: |
| | _ D # Q # | Site # | (indicate on attached map) |
| The second secon | | The state of the s | 19 |

| г | 17 | W | W. | 17 | |
|----|----|----|----|----|--|
| B | 1 | ۲. | .7 | 1 | |
| 15 | | | | | |



| Provide the following information for the stream reach under assessment: |
|---|
| 1. Applicant's name: Dominion 2. Evaluator's name: DDWEST |
| 3. Date of evaluation: 8-7-12/ |
| 5. Name of stream: Unhamed trib to Swamp6. River basin: TAR - PAMIL 60 |
| 7. Approximate drainage area: >50 kgres 8. Stream order: 54 |
| 9. Length of reach evaluated: 1000 10. County: Hali from |
| 11. Site coordinates (if known): prefer in decimal degrees. 12. Subdivision name (if any); na |
| Latitude (ex. 34.872312): 36 17' 39.610" Longitude (ex77.556611): 77 40' 02.872" |
| Method location determined (circle): GPS Topo Sheet Ortho (Aerial) Photo/GIS Other GIS Other |
| 14. Proposed channel work (if any): |
| 15. Recent weather conditions: Dry - Jew showers |
| 16. Site conditions at time of visit: Normal |
| 17. Identify any special waterway classifications known: Section 10 Aidal Waters Sessential Fisheries Habitat Naturient Sensitive Waters Water Supply Watershed (I-IV) |
| 18. Is there a pond or lake located upstream of the evaluation point? YES NO If yes, estimate the water surface area: |
| 19. Does channel appear on USGS quad map? YES NO 20. Does channel appear on USDA Soil Survey? YES NO |
| 21. Estimated watershed land use:% Residential% Commercial% Industrial% Agricultural |
| Cleared / Logged% Other (|
| 22. Bankfull width: 23. Bank height (from bed to top of bank): |
| 24. Channel slope down center of stream: Flat (0 to 2%)Gentle (2 to 4%)Moderate (4 to 10%)Steep (>10%) |
| 25. Channel sinuosity:StraightOccasional bendsFrequent meanderVery sinuousBraided channel |
| Instructions for completion of worksheet (located on page 2): Begin by determining the most appropriate ecoregion based on location, terrain, vegetation, stream classification, etc. Every characteristic must be scored using the same ecoregion. Assign points to each characteristic within the range shown for the ecoregion. Page 3 provides a brief description of how to review the characteristics identified in the worksheet. Scores should reflect an overall assessment of the stream reach under evaluation. If a characteristic cannot be evaluated due to site or weather conditions, enter 0 in the scoring box and provide an explanation in the comment section. Where there are obvious changes in the character of a stream under review (e.g., the stream flows from a pasture into a forest), the stream may be divided into smaller reaches that display more continuity, and a separate form used to evaluate each reach. The total score assigned to a stream reach must range between 0 and 100, with a score of 100 representing a stream of the highest quality. |
| Total Score (from reverse): 22 Comments: Men - made dith in edge during field this normal high worder marks |
| |
| Evaluator's Signature Date 8 - 7 - (4 |
| This channel evaluation form is intended to be used only as a guide to assist landowners and environmental professionals in gathering the data required by the United States Army Corps of Engineers to make a preliminary assessment of stream |
| quality. The total score resulting from the completion of this form is subject to USACE approval and does not imply a particular mitigation ratio or requirement. Form subject to change – version 06/03. To Comment, please call 919-876-8441 x 26. |

STREAM QUALITY ASSESSMENT WORKSHEET SHLHOIS

| 111111111111111111111111111111111111111 | # | CHARACTERISTICS | ECOREGION POINT RANGE | | | less algebras |
|--|----------------|---|--|--|----------|-------------------------|
| | | | Coastal | Piedmont | Mountain | SCORE |
| PHYSICAL | 1 | Presence of flow / persistent pools in stream | 0 – 5 | 0-4 | | 1 |
| | | (no flow or saturation = 0; strong flow = max points) | 0-3 | 0-4 | 0-5 | 1 |
| | 2 | Evidence of past human alteration | 0-6 | 0-5 | 0.5 | 7 |
| | | (extensive alteration = 0; no alteration = max points) | | 0-3 | 0-5 | 1 |
| | 3 | Riparian zone | 0-6 | 0-4 | 0 5 | 1 |
| | | (no buffer = 0; contiguous, wide buffer = max points) | | 0-4 | 0-5 | / |
| | 5 | Evidence of nutrient or chemical discharges | 0-5 | 0-4 | 0-4 | 1 |
| | | (extensive discharges = 0; no discharges = max points) | | the state of the s | 0-4 | (|
| | | Groundwater discharge | 0 – 3 | 0-4 | 0-4 | 7 |
| | 6 | (no discharge = 0; springs, seeps, wetlands, etc. = max points) | | | 0-4 | / |
| | | Presence of adjacent floodplain | 0-4 | 0-4 | 0-2 | 1 |
| | | (no floodplain = 0; extensive floodplain = max points) | | | 0-2 | 1 |
| P | 8 | Entrenchment / floodplain access | 0-5 | 0-4 | 0-2 | 1 |
| | | (deeply entrenched = 0; frequent flooding = max points) | | Eurast Miles | 0-2 | 1 |
| | | Presence of adjacent wetlands | 0-6 | 0-4 | 0-2 | 1 |
| | | (no wetlands = 0; large adjacent wetlands = max points) | | 2.7 | 0-2 | |
| | 9 | Channel sinuosity (extensive channelization = 0; natural meander = max points) | 0 – 5 | 0-4 | 0-3 | , |
| | | Sediment input | | | 0 3 | |
| | 10 | (extensive deposition= 0; little or no sediment = max points) | 0-5 | 0-4 | 0 – 4 | 1 |
| | | Size & diversity of channel bed substrate | | | | 1 |
| | 11 | (fine, homogenous = 0; large, diverse sizes = max points) | NA* | 0-4 | 0 – 5 | IAA |
| | 12 13 14 | Evidence of channel incision or widening | | | | 70. |
| × | | (deeply incised = 0; stable bed & banks = max points) | 0-5 | 0-4 | 0-5 | 1 |
| STABILITY | | Presence of major bank failures | eg Delisi'a Araba (i.e.) Sanasaran Jangaran Aliyo | | | |
| E | | (severe erosion = 0; no erosion, stable banks = max points) | 0-5 | 0-5 | 0-5 | |
| B | | Root depth and density on banks | | | | , |
| I | | (no visible roots = 0; dense roots throughout = max points) | 0-3 | 0 – 4 | 0-5 | Che ! |
| S | 15 | Impact by agriculture, livestock, or timber production | | | | - ca |
| | | (substantial impact =0; no evidence = max points) | 0-5 | 0-4 | 0-5 | |
| | 16 | Presence of riffle-pool/ripple-pool complexes | The state of the s | | | |
| L | | (no riffles/ripples or pools = 0; well-developed = max points) | 0-3 | 0 – 5 | 0-6 | \mathcal{D} |
| HABITAT | 17 | Habitat complexity | | | | |
| II | | (little or no habitat = 0; frequent, varied habitats = max points) | 0-6 | 0-6 | 0-6 | 2 |
| P | 18 | Canopy coverage over streamhed | | | | 1 |
| H | | (no shading vegetation = 0; continuous canopy = max points) | 0-5 | 0-5 | 0-5 | |
| BIOLOGY | 19 | Substrate embeddedness | | | | (1 M |
| | | (deeply embedded = 0; loose structure = max) | NA* | 0-4 | 0-4 | NW |
| | 20 | Presence of stream invertebrates (see page 4) | | | | |
| | | (no evidence = 0; common, numerous types = max points) | 0-4 | 0-5 | 0 – 5 | Δ |
| | | Presence of amphibians | | | | $\stackrel{\sim}{\sim}$ |
| | | (no evidence = 0; common, numerous types = max points) | 0-4 | 0-4 | 0-4 | 2 |
| 0 | 22 | Presence of fish | | | | |
| BI | | (no evidence = 0; common, numerous types = max points) | 0-4 | 0-4 | 0-4 | () |
| | 23 | Evidence of wildlife use | 0.7 | | | ~ |
| | | (no evidence = 0; abundant evidence = max points) | 0-6 | 0-5 | 0-5 | 2 |
| Trial policy in the second sec | | | | | | The state of |
| Total Points Possible 100 100 100 | | | | | | |
| TOTAL SCORE (also enter on first page) | | | | | | 2 |
| 100000 | 40000000000 | naracteristics are not assessed in coastal strange | r page) | | | 1// |

^{*} These characteristics are not assessed in coastal streams.

shlh019 NC DWQ Stream Identification Form Version 4.11 Latitude: 36° 17'39. 610 Date: Project/Site: Longitude: 77° 40' 02. 872" SOWEST Evaluator: County: **Total Points:** Other UNT to Marsh Swarhp Stream Determination (circle one) Stream is at least intermittent Ephemera Intermittent Perennial e.g. Quad Name: if ≥ 19 or perennial if ≥ 30* A. Geomorphology (Subtotal = Absent Weak Moderate Strong 1a. Continuity of channel bed and bank (2) 0 3 2. Sinuosity of channel along thalweg 0 71 2 3 3. In-channel structure: ex. riffle-pool, step-pool, (1) 0 2 3 ripple-pool sequence 4. Particle size of stream substrate 0 2 3 1 5. Active/relict floodplain 0 2 3 6. Depositional bars or benches 0 1 2 3 7. Recent alluvial deposits 0 2 1 3 8. Headcuts 0 1 3 9. Grade control 1 0 0.5 1.5 10. Natural valley 0 0.5 1 1.5 11. Second or greater order channel No = 0Yes = 3artificial ditches are not rated; see dispussions in manual B. Hydrology (Subtotal = 12. Presence of Baseflow 0 2 3 13. Iron oxidizing bacteria 0 3 14. Leaf litter 1.5 0.5 0 1 15. Sediment on plants or debris 0 0.5 1 1.5 16. Organic debris lines or piles 0 0.5 1 1.5 17. Soil-based evidence of high water table? No = 0Yes = 3 C. Biology (Subtotal = 0 18. Fibrous roots in streambed 19. Rooted upland plants in streambed 3 2 1 0 20. Macrobenthos (note diversity and abundance) 0 2 3 1 21. Aquatic Mollusks 2 3 0 1 22. Fish 1.5 0 0.5 1 23. Crayfish 1.5 0.5 0 (1.5) 24. Amphibians 0 0.5 1 25. Algae 0 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 methods. See p. 35 of manual. Notes: