



STATE OF TENNESSEE  
**DEPARTMENT OF ENVIRONMENT AND CONSERVATION**  
KNOXVILLE ENVIRONMENTAL FIELD OFFICE  
3711 MIDDLEBROOK PIKE  
KNOXVILLE, TENNESSEE 37921-6538  
PHONE (865) 594-6035 STATEWIDE 1-888-891-8332 FAX (865) 594-6105

June 23, 2022

Dan Murray

Subject: **Hydrologic Determination associated with slide Investigation  
National Coal Mine 7  
Unnamed Tributary to Lick Fork (UTDB2a)  
Campbell County, Tennessee**

On June 21, 2022, Bonnie Craighead, Chris Pracheil, and Dan Murray participated in a slide investigation at National Coal Mine 7, NPDES #TN0076376, SMCRA #3249. In conjunction with the slide investigation a hydrologic determination (HD) of an adjacent water feature was conducted. Division staff evaluated the feature at a waypoint identified as UTDB2a, located at 36.4984, -84.2881 and determined that the feature was a stream at this location. Supporting documentation is included within this report. The water feature exhibited a primary indicator, naturally occurring groundwater connection and a secondary indicator score (24) indicative that the feature is a stream. Based on the observations made and supporting photographs and documentation this feature is stream from an undetermined point upstream of latitude 36.4984, longitude -84.2881 downstream to Lick Fork Road at latitude 36.4921, longitude -84.29425

DIRECTION  
75 deg(T)

36.49844°N  
084.28809°W

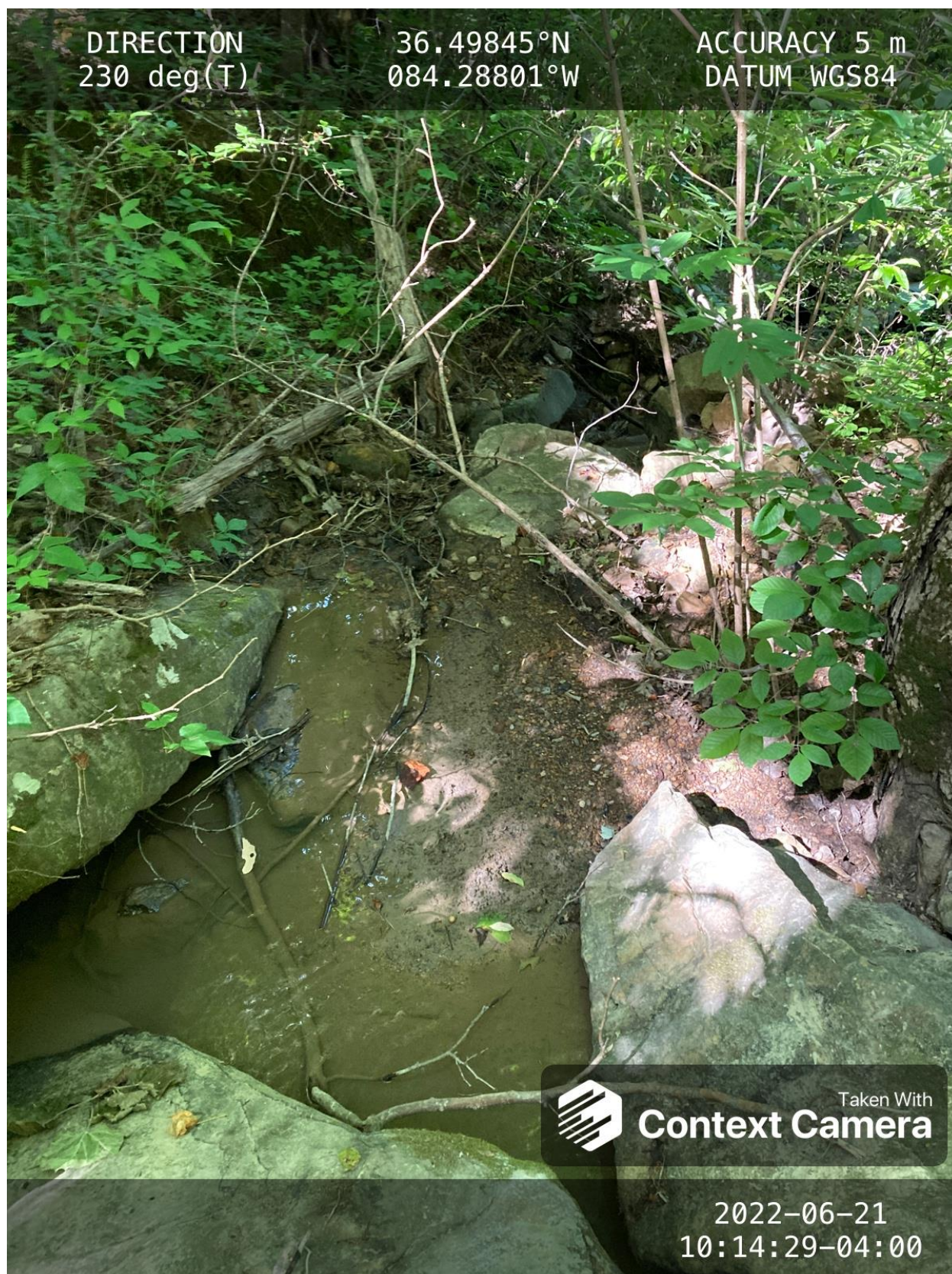
ACCURACY 9 m  
DATUM WGS84



Taken With  
**Context Camera**

2022-06-21  
10:14:20-04:00

UTDB2a Facing Upstream



UTDB2a Facing Downstream

DIRECTION  
50 deg(T)

36.49208°N  
084.29425°W

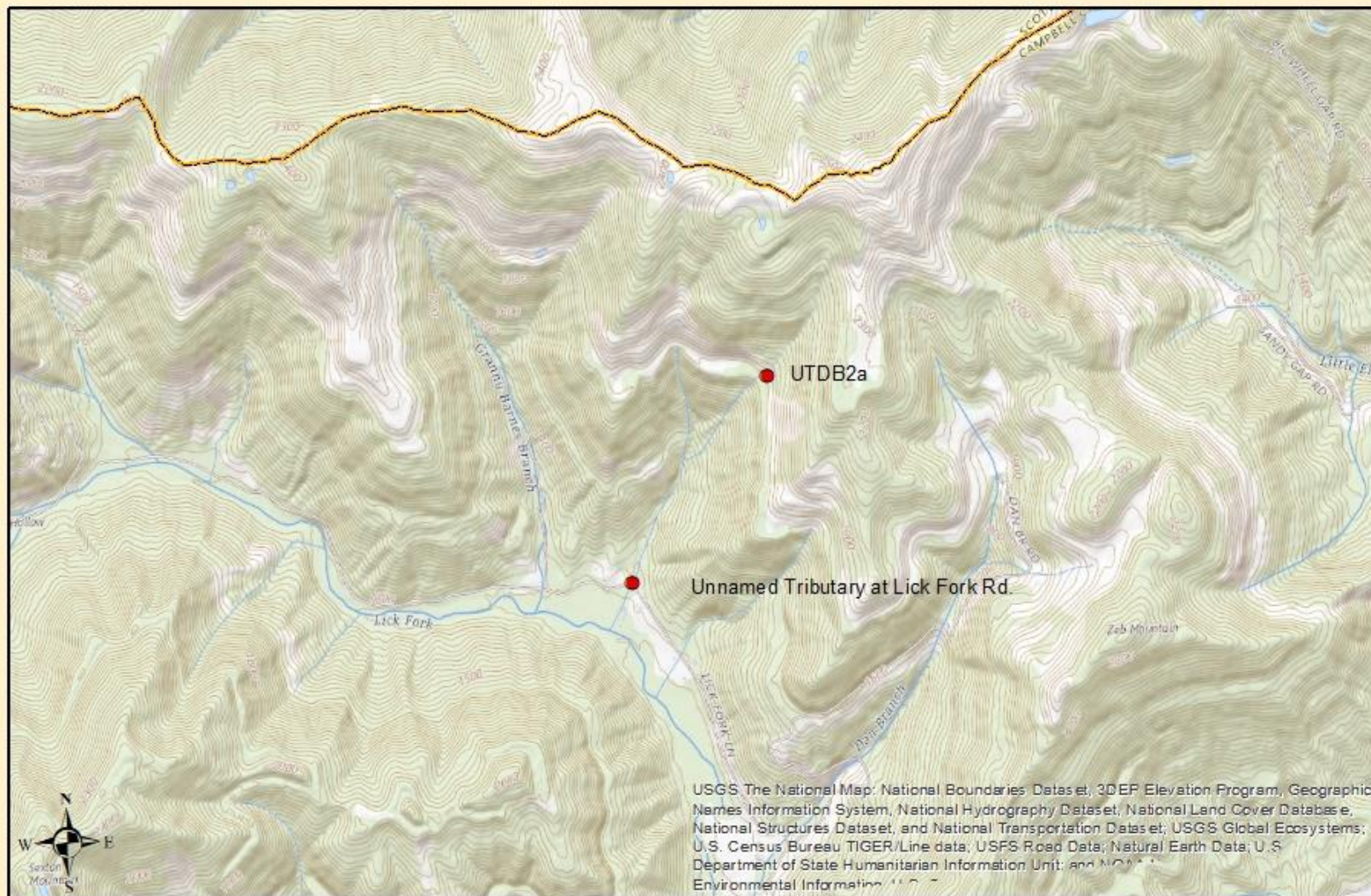
ACCURACY 15 m  
DATUM WGS84



Taken With  
**Context Camera**

2022-06-21  
12:30:42-04:00

Unnamed Tributary at Lick Fork Road



## UTDB2a Hydrologic Determination National Coal Mine 7

**Legend**  
TDEC\_GIS.TN\_Counties

0 0.1 0.2 0.4 0.6 0.8 Miles

Coordinate System: Albers  
Central Meridian: 96°0'0"W  
1st Std Parallel: 20°0'0"N  
2nd Std Parallel: 80°0'0"N  
Latitude of Origin: 40°0'0"N

**Hydrologic Determination Field Data Sheet**

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

|                                                                                                                                  |                       |                         |
|----------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------|
| Named Waterbody: Lick Creek                                                                                                      |                       | Date/Time: 6/21/22 1005 |
| Assessors/Affiliation: Dan Murray/TDEC Mining Section                                                                            |                       | Project ID :            |
| Site Name/Description: Unnamed Tributary to Lick Fork                                                                            |                       |                         |
| Site Location: National Coal Mine 7 (waypoint UTDB2a)                                                                            |                       |                         |
| HUC (12 digit): 051301010605 Clear Fork                                                                                          | Latitude: 36.498404   |                         |
| Previous Rainfall (7-days) : NOAA none to trace                                                                                  | Longitude: -84.288091 |                         |
| Precipitation this Season vs. Normal : average Antecedent Precipitation Tool USACE<br>Source of recent & seasonal precip. data : |                       |                         |
| Watershed Size : 0.9 sq. miles or 57.6 acres                                                                                     | County: Campbell      |                         |
| Soil Type(s) / Geology :                                                                                                         | Source:               |                         |
| Surrounding Land Use : Reclaimed Coal Mine/Forest                                                                                |                       |                         |
| Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) :<br>Moderate   |                       |                         |

**Primary Field Indicators Observed**

| Primary Indicators                                                                                                     | NO                                  | YES    |
|------------------------------------------------------------------------------------------------------------------------|-------------------------------------|--------|
| 1. Hydrologic feature exists solely due to a process discharge                                                         | <input checked="" type="checkbox"/> | WWC    |
| 2. Defined bed and bank absent, vegetation composed of upland and FACU species                                         | <input checked="" type="checkbox"/> | WWC    |
| 3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions N/A | <input type="checkbox"/>            | WWC    |
| 4. Daily flow and precipitation records showing feature only flows in direct response to rainfall                      | <input checked="" type="checkbox"/> | WWC    |
| 5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase                           | <input checked="" type="checkbox"/> | Stream |
| 6. Presence of fish (except <i>Gambusia</i> )                                                                          | <input checked="" type="checkbox"/> | Stream |
| 7. Presence of naturally occurring ground water table connection                                                       | <input type="checkbox"/>            | Stream |
| 8. Flowing water in channel and 7 days since last precip >0.1" in local watershed                                      | <input checked="" type="checkbox"/> | Stream |
| 9. Evidence watercourse has been used as a supply of drinking water                                                    | <input checked="" type="checkbox"/> | Stream |

**NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.**

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in  
*TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

**Overall Hydrologic Determination = STREAM****Secondary Indicator Score (if applicable) = 24.00****Justification / Notes :**

Numerous groundwater seeps along bank. Ambient water temperature 62oF/16.7oC. Hydropsychidae, chironomidae observed.

Stream meets the primary indicator for naturally occurring groundwater table connection.

Stream attains a secondary indicator score consistent with the results based on the primary indicator.

Precipitation moving from dry to normal conditions.

## Secondary Field Indicator Evaluation

| <b>A. Geomorphology</b> (Subtotal = 14.25)                     | <b>Absent</b> | <b>Weak</b> | <b>Moderate</b> | <b>Strong</b> |      |
|----------------------------------------------------------------|---------------|-------------|-----------------|---------------|------|
| 1. Continuous bed and bank                                     | 0             | 1           | 2               | 3             | 1    |
| 2. Sinuous channel                                             | 0             | 1           | 2               | 3             | 0.5  |
| 3. In-channel structure: riffle-pool sequences                 | 0             | 1           | 2               | 3             | 3    |
| 4. Sorting of soil textures or other substrate                 | 0             | 1           | 2               | 3             | 3    |
| 5. Active/relic floodplain                                     | 0             | 0.5         | 1               | 1.5           | 0    |
| 6. Depositional bars or benches                                | 0             | 1           | 2               | 3             | 2    |
| 7. Braided channel                                             | 0             | 1           | 2               | 3             | 0    |
| 8. Recent alluvial deposits                                    | 0             | 0.5         | 1               | 1.5           | 1.25 |
| 9. Natural levees                                              | 0             | 1           | 2               | 3             | 0    |
| 10. Headcuts                                                   | 0             | 1           | 2               | 3             | 0.5  |
| 11. Grade controls                                             | 0             | 0.5         | 1               | 1.5           | 1.5  |
| 12. Natural valley or drainageway                              | 0             | 0.5         | 1               | 1.5           | 1.5  |
| 13. At least second order channel on existing USGS or NRCS map | 0             | 1           | 2               | 3             | 0    |

| <b>B. Hydrology</b> (Subtotal = 8.25)               | <b>Absent</b> | <b>Weak</b> | <b>Moderate</b> | <b>Strong</b> |      |
|-----------------------------------------------------|---------------|-------------|-----------------|---------------|------|
| 14. Subsurface flow/discharge into channel          | 0             | 1           | 2               | 3             | 2.5  |
| 15. Water in channel and >48 hours since sig. rain  | 0             | 1           | 2               | 3             | 2.5  |
| 16. Leaf litter in channel                          | 1.5           | 1           | 0.5             | 0             | 1.25 |
| 17. Sediment on plants or on debris                 | 0             | 0.5         | 1               | 1.5           | 1.5  |
| 18. Organic debris lines or piles (wrack lines)     | 0             | 0.5         | 1               | 1.5           | 0.5  |
| 19. Hydric soils in channel bed or sides of channel | No = 0        |             | Yes = 1.5       |               | 0    |

| <b>C. Biology</b> (Subtotal = 1.50)              | <b>Absent</b> | <b>Weak</b> | <b>Moderate</b> | <b>Strong</b> |     |
|--------------------------------------------------|---------------|-------------|-----------------|---------------|-----|
| 20. Fibrous roots in channel bed <sup>1</sup>    | 3             | 2           | 1               | 0             | NA  |
| 21. Rooted plants in the thalweg <sup>1</sup>    | 3             | 2           | 1               | 0             | NA  |
| 22. Crayfish in stream (exclude in floodplain)   | 0             | 1           | 2               | 3             | 0   |
| 23. Bivalves/mussels                             | 0             | 1           | 2               | 3             | 0   |
| 24. Amphibians                                   | 0             | 0.5         | 1               | 1.5           | 0   |
| 25. Macroinvertebrates (record type & abundance) | 0             | 1           | 2               | 3             | 1   |
| 26. Filamentous algae; periphyton                | 0             | 1           | 2               | 3             | 0   |
| 27. Iron oxidizing bacteria/fungus               | 0             | 0.5         | 1               | 1.5           | 0.5 |
| 28. Wetland plants in channel bed <sup>2</sup>   | 0             | 0.5         | 1               | 1.5           | 0   |

<sup>1</sup> Focus is on the presence of terrestrial plants.

<sup>2</sup> Focus is on the presence of aquatic or wetland plants.

**Total Points = 24.00**

*Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points*

### Notes :

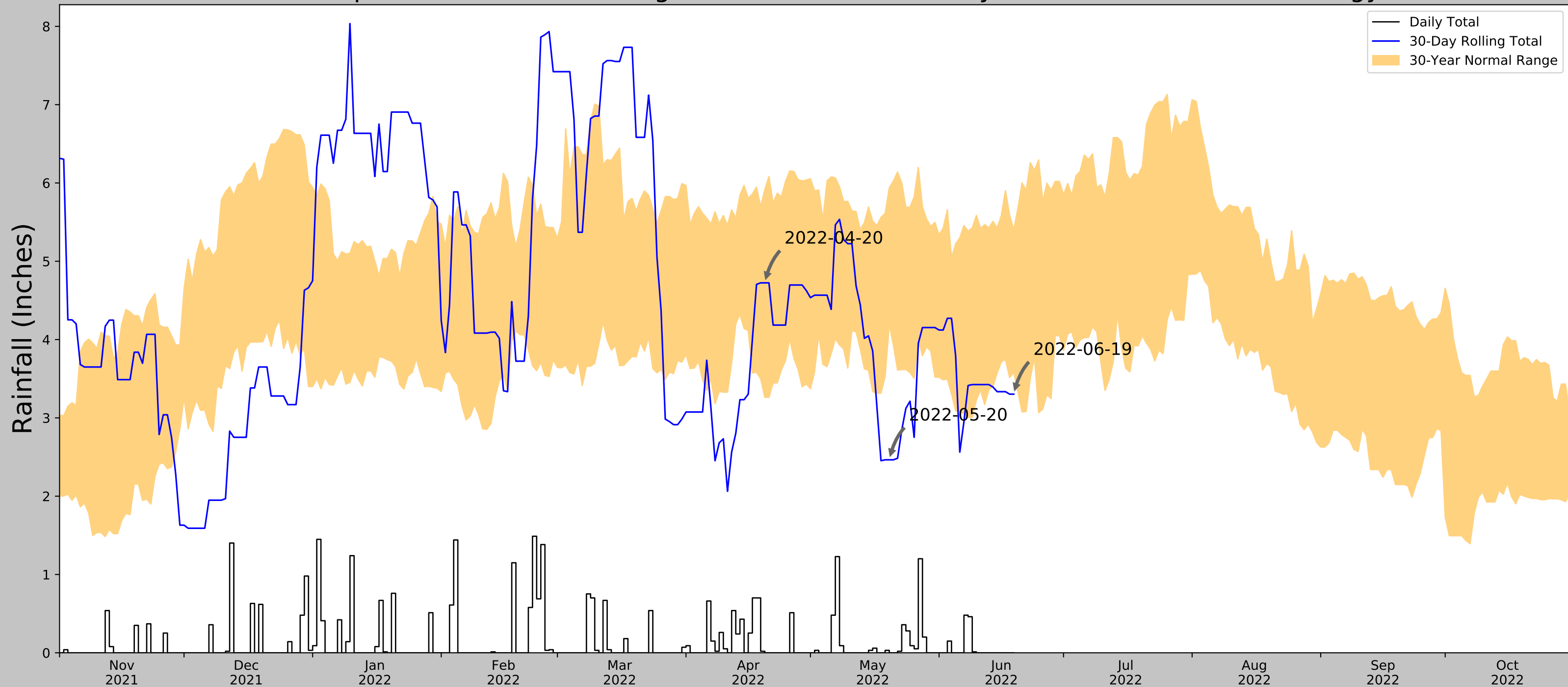
Channel canopy mature and heavily shades the channel. Sparse macroinvertebrate population (trichopteran, chironomids) with intensive searching.

Heavy fine sediment in pools and in areas of deposition. Flow estimate approximately 25gallons/min. or 0.06cfs. Stream varied between 4 & 6 feet.

Initially scored Biology 20 as absent/weak(2.5) and 21 as absent(3). However, due to the steep grade and step/pool formed by boulders not suitable for roots or plant the score was revised with these parameters marked as "not applicable".

Hydric soils were also not evaluated.

# Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



|                                  |                        |
|----------------------------------|------------------------|
| Coordinates                      | 36.498404, -84.288091  |
| Observation Date                 | 2022-06-19             |
| Elevation (ft)                   | 1856.14                |
| Drought Index (PDSI)             | Mild wetness (2022-05) |
| WebWIMP H <sub>2</sub> O Balance | Wet Season             |

| 30 Days Ending | 30 <sup>th</sup> %ile (in) | 70 <sup>th</sup> %ile (in) | Observed (in) | Wetness Condition | Condition Value | Month Weight | Product               |
|----------------|----------------------------|----------------------------|---------------|-------------------|-----------------|--------------|-----------------------|
| 2022-06-19     | 3.578347                   | 5.399213                   | 3.30315       | Dry               | 1               | 3            | 3                     |
| 2022-05-20     | 4.196063                   | 5.937795                   | 2.464567      | Dry               | 1               | 2            | 2                     |
| 2022-04-20     | 3.262205                   | 5.916142                   | 4.72441       | Normal            | 2               | 1            | 2                     |
| Result         |                            |                            |               |                   |                 |              | Drier than Normal - 7 |

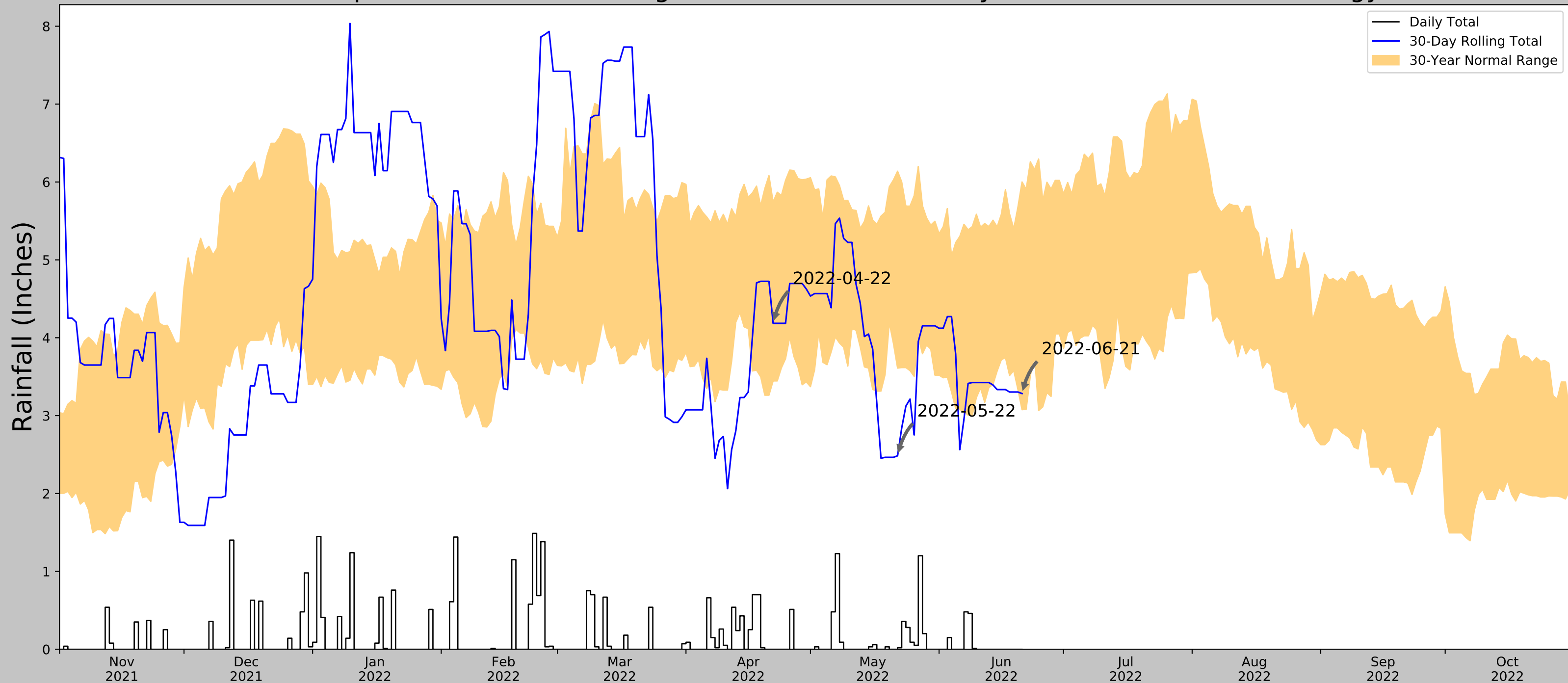


Figure and tables made by the  
**Antecedent Precipitation Tool**  
Version 1.0

Written by Jason Deters  
U.S. Army Corps of Engineers

| Weather Station Name | Coordinates       | Elevation (ft) | Distance (mi) | Elevation Δ | Weighted Δ | Days Normal | Days Antecedent |
|----------------------|-------------------|----------------|---------------|-------------|------------|-------------|-----------------|
| NEWCOMB              | 36.5517, -84.1728 | 1014.108       | 7.385         | 842.032     | 9.542      | 11337       | 88              |
| WILLIAMSBURG         | 36.7333, -84.15   | 939.961        | 12.611        | 74.147      | 6.61       | 12          | 0               |
| WILLIAMSBURG 1NW     | 36.7458, -84.1753 | 1080.053       | 13.412        | 65.945      | 6.92       | 3           | 0               |
| STEARNS 2S           | 36.6736, -84.4792 | 1220.144       | 18.966        | 206.036     | 12.442     | 1           | 1               |
| NORRIS 0.6 NW        | 36.1997, -84.0765 | 1158.137       | 24.904        | 144.029     | 14.794     | 0           | 1               |

# Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



|                                  |                        |
|----------------------------------|------------------------|
| Coordinates                      | 36.498404, -84.288091  |
| Observation Date                 | 2022-06-21             |
| Elevation (ft)                   | 1856.14                |
| Drought Index (PDSI)             | Mild wetness (2022-05) |
| WebWIMP H <sub>2</sub> O Balance | Wet Season             |

| 30 Days Ending | 30 <sup>th</sup> %ile (in) | 70 <sup>th</sup> %ile (in) | Observed (in) | Wetness Condition | Condition Value | Month Weight | Product                |
|----------------|----------------------------|----------------------------|---------------|-------------------|-----------------|--------------|------------------------|
| 2022-06-21     | 3.075984                   | 6.001181                   | 3.283465      | Normal            | 2               | 3            | 6                      |
| 2022-05-22     | 3.609843                   | 6.138977                   | 2.484252      | Dry               | 1               | 2            | 2                      |
| 2022-04-22     | 3.445669                   | 5.743701                   | 4.18504       | Normal            | 2               | 1            | 2                      |
| Result         |                            |                            |               |                   |                 |              | Normal Conditions - 10 |



Figure and tables made by the  
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| Weather Station Name | Coordinates       | Elevation (ft) | Distance (mi) | Elevation $\Delta$ | Weighted $\Delta$ | Days Normal | Days Antecedent |
|----------------------|-------------------|----------------|---------------|--------------------|-------------------|-------------|-----------------|
| NEWCOMB              | 36.5517, -84.1728 | 1014.108       | 7.385         | 842.032            | 9.542             | 11337       | 87              |
| WILLIAMSBURG         | 36.7333, -84.15   | 939.961        | 12.611        | 74.147             | 6.61              | 12          | 0               |
| WILLIAMSBURG 1NW     | 36.7458, -84.1753 | 1080.053       | 13.412        | 65.945             | 6.92              | 3           | 0               |
| STEARNS 2S           | 36.6736, -84.4792 | 1220.144       | 18.966        | 206.036            | 12.442            | 1           | 1               |
| NORRIS 0.6 NW        | 36.1997, -84.0765 | 1158.137       | 24.904        | 144.029            | 14.794            | 0           | 1               |
| Linear Interpolation | N/A               | N/A            | N/A           | N/A                | N/A               | 0           | 1               |