



U.S. DEPARTMENT OF AGRICULTURE

Natural Resources Conservation Service  
August, 2026

PEAX-005-53-042-1214289995

# Appendix F: Environmental Assessment for the Watershed Project Plan Legacy Sediment Removal in the Chiques Creek Watershed in Lancaster County, Pennsylvania and Finding of No Significant Impact (FONSI)



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## PROPOSAL INFORMATION

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### General Information

**Proposal Name:** Legacy Sediment Removal in the Chiques Creek Watershed in Lancaster County, Pennsylvania

**Proposal Tracking #:** PEAX-005-53-042-1214289995

**Proposal Initiation Date:** 7/18/2024

**Proponent Name:** Lancaster County Conservation District and the Lancaster County Commissioners

**Signing Authority:** Pennsylvania State Conservationist

**Responsible Official:** Denise Coleman

**Unit:** Pennsylvania State Office

**Anticipated Implementation of Proposal:** 2026-2035

**Proposal Record Location:** <https://www.nrcs.usda.gov/programs-initiatives/watershed-protection-and-flood-prevention-operations-program/pennsylvania>

**Proposal Webpage:** <https://www.nrcs.usda.gov/state-offices/pennsylvania/chiques-creek-watershed-legacy-sediment-project>

**General Location of Proposal:** The Chiques Creek watershed is in the Lower Susquehanna River Basin, which drains to Chesapeake Bay. The watershed centroid is 40.1605° N, 76.4523° W. The Chiques Creek watershed has a 10-digit hydrologic unit code (HUC), 0205030608, and contains four 12-digit hydrologic units: Upper Chiques Creek (HUC 020503060801), Little Chiques Creek (HUC 020503060802), Donegal Creek (HUC 020503060803), and Lower Chiques Creek (HUC 020503060804). The Donegal Creek hydrologic unit was excluded from the study because its confluence with Chiques Creek is downstream of the USGS Stream Gage that will provide key water quality data to support the Project. The project area is a 101.6-square-mile (sq. mi.) portion of the Chiques Creek watershed within Lancaster County, Pennsylvania, excluding the Donegal Creek subwatershed and the 7.7-square-mile portion of the Chiques Creek watershed in Lebanon County, Pennsylvania

All projects completed will be within the riparian corridors of the watershed.

### Purpose and Need

The purpose of the project is to address water quality concerns associated with the nutrient-laden legacy sediment loads entering the Lower Susquehanna River and Chesapeake Bay from the Chiques Creek watershed while maintaining or improving the stream function and habitat value. Chiques Creek contributes approximately 70 million pounds per year of nutrient-laden sediment (total annual load) into Chesapeake Bay. Over 60 percent, or 42 million pounds of sediment, is from streambank erosion of legacy sediment (SRBC, 2019). The erosion and transport of nutrient-laden legacy

sediment in Chiques Creek produces negative environmental and economic consequences both locally within Chiques Creek and regionally in the Chesapeake Bay.

## **Proposed Action: Legacy Sediment Treatment Program**

The proposed action would authorize program funds under PL 83-566 to provide federal technical and financial cost-share assistance for water quality improvements along at least 29,000 feet of riparian corridor within the Chiques Creek watershed.

Voluntary applicants would propose legacy sediment stabilization or removal using conservation systems with demonstrated water quality benefits. Each land treatment project would be required to include one or more core conservation practices to be eligible for the program, Table 1.

**Table 1. Primary conservation practices for inclusion in the Chiques Creek watershed project**

| <b>Conservation Practices</b>       | <b>CPS<sup>1</sup> Code</b> |
|-------------------------------------|-----------------------------|
| Aquatic Organism Passage            | 396                         |
| Channel Bed Stabilization           | 584                         |
| Riparian Forest Buffer              | 391                         |
| Riparian Herbaceous Cover           | 390                         |
| Streambank and Shoreline Protection | 580                         |

<sup>1</sup> Conservation Practice Standard.

Supporting practices can be installed with the associated primary practice to enhance a project or increase the benefits of the conservation system and are shown in Table 2

**Table 2. Supporting conservation practices for inclusion in the Chiques Creek watershed project**

| <b>Conservation Practices</b>                        | <b>CPS<sup>1</sup> Code</b> |
|------------------------------------------------------|-----------------------------|
| Access Control                                       | 472                         |
| Access Road                                          | 560                         |
| Clearing and Snagging                                | 326                         |
| Conservation Cover                                   | 327                         |
| Constructed Wetland                                  | 656                         |
| Critical Area Planting                               | 342                         |
| Dike                                                 | 356                         |
| Fence                                                | 382                         |
| Grade Stabilization Structure                        | 410                         |
| Hedgerow Planting                                    | 422                         |
| Heavy Use Area Protection                            | 561                         |
| Lined Waterway or Outlet                             | 468                         |
| Livestock Pipeline                                   | 516                         |
| Mulching                                             | 484                         |
| Obstruction Removal                                  | 500                         |
| Open Channel                                         | 582                         |
| Pumping Plant                                        | 533                         |
| Restoration of Rare or Declining Natural Communities | 643                         |
| Shallow Water Development and Management             | 646                         |

| <b>Conservation Practices</b>             | <b>CPS<sup>1</sup> Code</b> |
|-------------------------------------------|-----------------------------|
| Stormwater Runoff Control                 | 570                         |
| Stream Crossing                           | 578                         |
| Stream Habitat Improvement and Management | 395                         |
| Structure for Water Control               | 587                         |
| Structures for Wildlife                   | 649                         |
| Subsurface Drain                          | 606                         |
| Trails and Walkways                       | 575                         |
| Tree/Shrub Establishment                  | 612                         |
| Underground Outlet                        | 620                         |
| Water Well                                | 642                         |
| Watering Facility                         | 614                         |
| Wetland Creation                          | 658                         |
| Wetland Enhancement                       | 659                         |
| Wetland Restoration                       | 657                         |
| Wetland Wildlife Habitat Management       | 644                         |
| Wildlife Habitat Planting                 | 420                         |

<sup>1</sup> Conservation Practice Standard.

The specific treatment systems installed by Alternative 1 would be driven by the land enrolled in the program and evaluated on a site-specific basis. The planned land treatment measures implemented resulting from the program are shown in Table 3. While other conservation practices may be implemented depending on site requirements, this table only includes the conservation practices that would be expected to be included in every installation of that specific treatment system.

**Table 3. Land treatment measures and example conservation practices for inclusion in the Chiques Creek watershed project**

| <b>Land Treatment Measure</b>              | <b>Typical Conservation Practices and CPS<sup>1</sup> Code</b>                                                                                                   |
|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Legacy Sediment Stabilization              | Critical Area Planting (342)<br>Mulching (484)<br>Streambank and Shoreline Protection (580)                                                                      |
| Riparian Buffer                            | Riparian Herbaceous Cover (390)<br>Riparian Forest Buffer (391)                                                                                                  |
| Legacy Sediment Removal & Site Restoration | Riparian Herbaceous Cover (390)<br>Riparian Forest Buffer (391)<br>Aquatic Organism Passage (396)<br>Mulching (484)<br>Streambank and Shoreline Protection (580) |
| Mill Dam Removal <sup>2</sup>              | Obstruction Removal (500)                                                                                                                                        |

Notes:

<sup>1</sup> Conservation Practice Standard.

<sup>2</sup> Typically used in combination with either Legacy Sediment Stabilization or Legacy Sediment Removal & Site Restoration. Mill Dam Removal is not usually a stand-alone treatment alternative due to the potential for legacy sediment mobilization after the dam is removed

While the program is voluntary and treatments will be based on applicants received, the following streambank length treated is estimated to be:

| <b>Treatment</b>         | <b>Estimated Contracts</b> | <b>Streambank Treated</b> |
|--------------------------|----------------------------|---------------------------|
| Dam Removal              | 1                          | 1,650 ft                  |
| Floodplain Restoration   | 5                          | 12,500 ft                 |
| Riparian Buffers         | 10                         | 10,000 ft                 |
| Streambank Stabilization | 5                          | 5,000 ft                  |
| <b>Total</b>             | <b>21</b>                  | <b>29,150 ft</b>          |

## **No Action**

Without additional funding from a program like the proposed, implementing legacy sediment projects within the watershed would likely continue, but these projects generally do not have a broadly-applied approach at the watershed-scale and are narrowly scoped, primarily due to funding limitations. The impacts of watershed scale removal and stabilization would not be measured. Therefore, the monetary benefits may not be realized as it relates to sediment and nutrient reduction, floodplain restoration, and flood prevention.

Sponsoring Local Organizations (SLOs) and other organizations will likely continue to pursue other programs and funding sources to reduce the erosion and transport of legacy sediment in the watershed, and from the watershed to downstream water bodies such as the Chesapeake Bay. Legacy sediment streambank erosion and transport is likely to continue moving at least 42 million pounds of nutrient laden sediment to the Chesapeake Bay each year, exacerbating environmental impacts from reduced water quality.

## **Alternatives Considered but Not Analyzed in Detail**

### Targeted Treatment Sites

NRCS and the SLO would complete legacy sediment restoration projects on two of the highest eroding streambank sites within the watershed. This alternative would treat about 2.75 miles of streambank. However, these highest erosion rate sites in the watershed are privately owned. Project costs would be significantly higher for the SLO because of eminent domain processes, land acquisition, and O&M requirements if the landowners are unwilling to have a project on their property. Land acquisition would likely account for more of the SLO's project budget than constructing land treatment projects, and the costs for them would likely far outweigh the benefits.

### Full Conservation Practice Alternative

This alternative would make the full suite of the NRCS' Pennsylvania conservation practices across all landscapes available to program applicants to achieve program objectives. Almost 140 conservation practices could be used as stand-alone or combined conservation systems, so long as they achieve the desired results of reducing sediment within the surface waters. Applicants would have the flexibility to propose more wide-ranging practices increasing the scope and extent of water quality

improvement projects that could be approved for technical and financial assistance. However, this alternative did not always meet the project purpose of addressing legacy sediment erosion as this alternative would allow work on other non-riparian landscapes.

#### Singular Practice Alternative(s)

Similar to Alternative 1, individual alternatives were developed to include only one land treatment system based on one core conservation practice. Each project would be required to include one core conservation practice. The individual systems examined included riparian buffer installation, streambank stabilization, and legacy sediment restoration. While each practice individually can perform well, success is dependent upon appropriate site conditions. To be able to maximize benefits across the watershed, depending upon individual voluntarily offered site characteristics, each practice type should be available for use within the program. These alternatives with one core conservation practice preclude stabilizing highly erosive sites that do not meet site criteria for that practice. Because of this, the singular practice alternatives were dismissed.

#### Land Use Restrictions

An alternative was considered to implement regulations to restrict the land use of the riparian and mandating a buffer width from the top of the streambank. Working with local municipalities within the watershed, ordinances would be implanted and enforced to require a minimum buffer width from the top of the creek. This alternative was dismissed as it does not address the active erosion occurring from the streambanks. This alternative was not considered in combination with any other alternatives due to Pennsylvania's Agriculture, Communities and Rural Environment (ACRE) Act 38 of 2005. ACRE prevents the development of local regulations that are more stringent than state law. To enact a local buffer requirement would require enacting a state-wide buffer requirement.

## **INTERDISCIPLINARY PROPOSAL SCREENING**

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Given the nature of the proposal, the responsible official is requesting documentation to demonstrate compliance with the following legal and regulatory considerations in addition to NEPA:

- |                                                                               |                                                                |
|-------------------------------------------------------------------------------|----------------------------------------------------------------|
| <input checked="" type="checkbox"/> Endangered Species Act (ESA)              | <input checked="" type="checkbox"/> Pertinent Executive Orders |
| <input checked="" type="checkbox"/> National Historic Preservation Act (NHPA) |                                                                |
| <input checked="" type="checkbox"/> Tribal Consultation (EO 13175)            |                                                                |
| <input checked="" type="checkbox"/> Clean Air Act (CAA)                       |                                                                |
| <input checked="" type="checkbox"/> Clean Water Act (CWA)                     |                                                                |

**Special Management Areas:**

- ☐ Coastal Zone Management Areas
- ☐ Conservation Easements
- ☐ Coral Reefs
- ☐ Inventoried Roadless
- ☐ Marine Sanctuaries
- ☐ National Recreation Areas

- ☐ National Scenic & Historic Trails
- ☐ Research or Experimental Areas
- ☐ Wild & Scenic River Corridors
- ☐ Wilderness
- ☐ Other:

**Scope of Analysis**

PL 83-566 projects are bounded in scope by the size of the watershed area, characteristics of the benefitted area, and size of potential measures considered. The Chiques Creek watershed (excluding Donegal Creek) is about 70,000 acres, which is less than the maximum area of 250,000 acres. About 80 percent of the watershed land use is rural, which exceeds the minimum 20 percent of benefits provided directly related to agriculture, which includes rural communities with populations less than 50,000 people.

**Agencies and Persons Consulted**

Given the nature of the proposal, the responsible official consulted the following agencies, organizations, tribes, and persons during development and analysis of the proposal:

|         | Agency                                                                                                                                                                                                                                                                                                                                                       |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Federal | Federal Emergency Management Agency, Region III<br>National Marine Fisheries Service<br>U.S. Army Corps of Engineers (USACE), Baltimore District<br>U.S. Environmental Protection Agency, Region 3<br>U.S. Farm Service Agency<br>U.S. Fish and Wildlife Service<br>U.S. Geological Survey                                                                   |
| State   | Pennsylvania Department of Agriculture<br>Pennsylvania Department of Conservation and Natural Resources<br>Pennsylvania Department of Environmental Protection (PADEP)<br>Pennsylvania Emergency Management Agency<br>Pennsylvania Fish and Boat Commission<br>Pennsylvania State Conservation Commission<br>Pennsylvania State Historic Preservation Office |
| Local   | Chiques Creek Watershed Alliance<br>Lancaster Clean Water Partners<br>Water Science Institute                                                                                                                                                                                                                                                                |
| Tribal  | Absentee-Shawnee Tribe of Indians of Oklahoma<br>Delaware Nation, Oklahoma                                                                                                                                                                                                                                                                                   |

|       |                                                                                   |
|-------|-----------------------------------------------------------------------------------|
|       | Delaware Tribe of Indians<br>Eastern Shawnee Tribe of Oklahoma<br>Shawnee Tribe   |
| Other | American Rivers, Mid-Atlantic Office<br>Susquehanna River Basin Commission (SRBC) |

**Table 4: Applicable proposal record documentation to support agencies/persons consulted**

| Documentation Type                     | File Name                                                                |
|----------------------------------------|--------------------------------------------------------------------------|
| USGS Stream Gage Data                  | USGS Super Stream Gage (Station Number <a href="#">01575900</a> )        |
| Watershed Alternative Restoration Plan | Chiques Creek Watershed Alternative Restoration Plan, 2019               |
| Flood Resiliency Study                 | Chiques Creek Flood Resiliency Study, 2018.                              |
| Conservation Plan                      | Little Chiques Creek Watershed Rivers Conservation Plan, 2005.           |
| Water Resources and Restoration Plan   | Chesapeake Bay Comprehensive Water Resources and Restoration Plan, 2021. |
| Watershed Restoration Action Strategy  | Watershed Restoration Action Strategy (WRAS), 2003.                      |
| TMDL Plan                              | Total Maximum Daily Loads (TMDL) for Donegal Creek Watershed, 2000.      |

## Substantive Issues Considered for Analysis

Relevant and substantive issues considered for analysis include soils, water, air, plant and animal, and human concerns, which are summarized in Table 5.

**Table 5. Issues considered for analysis (Chiques Creek Watershed).**

| Resource                                                                 | Substantive | Rationale                                                                                                                                                                                                                                                                                 |
|--------------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Soil Related Concerns</b>                                             |             |                                                                                                                                                                                                                                                                                           |
| Soil Resources                                                           | Yes         | Significant streambank erosion was identified in many areas throughout the watershed. Streambank erosion has been identified as the primary cause of excessive siltation in the planning area. The streambank erosion rate occurring in the watershed project area is 0.1 acres per year. |
| Prime and Unique Farmland, and Farmland of Statewide or Local Importance | Yes         | Many areas within the watershed contain soils designated as Prime Farmland and Farmland of Statewide or Local Importance. The proposed action will impact farmland soils and could result in removing farmland from production.                                                           |
| <b>Water Related Concerns</b>                                            |             |                                                                                                                                                                                                                                                                                           |
| Water Resources                                                          | Yes         | Legacy sediment can adversely affect water resources by causing transport and relocation of nutrient-laden sediment from the streambank.                                                                                                                                                  |
| Sole Source Aquifers                                                     | No          | Sole Source Aquifers are not located within or downstream of the watershed.                                                                                                                                                                                                               |

|                                                       |     |                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------------------------------------|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Water Quality                                         | Yes | Nutrient-laden sediments are transported to the streams in the watershed area by excessive erosion and freeze-thaw actions.                                                                                                                                                                                                                                                                                                                 |
| Floodplain Management                                 | Yes | Legacy sediment is primarily located within the floodplain.                                                                                                                                                                                                                                                                                                                                                                                 |
| Coastal Zone Management Areas                         | No  | Coastal Zone Management Areas are not located within the watershed.                                                                                                                                                                                                                                                                                                                                                                         |
| Waters of the U.S., Wetlands, & Special Aquatic Sites | Yes | Within the Chiques Creek watershed, legacy sediment terraces are immediately adjacent to Waters of the U.S. Wetlands are found adjacent to streams in many areas of the watershed.                                                                                                                                                                                                                                                          |
| Coral Reefs                                           | No  | Coral reefs are not located within the watershed.                                                                                                                                                                                                                                                                                                                                                                                           |
| Regional Water Resource Plans                         | Yes | The planning area is within the Chesapeake Bay watershed, which has a Total Mass Daily Load established for nitrogen, phosphorus, and sediments. Other regional plans encompassing the Chiques Creek Watershed include the PADEP Watershed Restoration Action Strategy, SRBC Watershed Alternative Restoration Plan, USACE Comprehensive Water Resources and Restoration Plan, and Little Chiques Creek Watershed Rivers Conservation Plan. |
| Wild and Scenic Rivers                                | No  | There are no water courses designated by the State of Pennsylvania as Scenic Rivers within the watershed.                                                                                                                                                                                                                                                                                                                                   |
| <b>Air Related Concerns</b>                           |     |                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Air Quality                                           | Yes | The use of gas-powered equipment during construction may result in minor, temporary impacts to air quality in the immediate vicinity of the Project. Lancaster County is currently in attainment status for particulate matter and is in nonattainment status for 8-hour (2008) ozone.                                                                                                                                                      |
| <b>Plant and Animal Related Concerns</b>              |     |                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Threatened and Endangered (T&E) Species               | Yes | T&E species were identified at some locations within the watershed and may be impacted by construction activities within the stream corridor.                                                                                                                                                                                                                                                                                               |
| Migratory Birds                                       | Yes | Stream corridors within the watershed provide respite and habitat for migratory birds.                                                                                                                                                                                                                                                                                                                                                      |
| Bald and Golden Eagles                                | Yes | Bald eagles are often seen within the watershed and could use the streams as a food source.                                                                                                                                                                                                                                                                                                                                                 |
| Essential Fish Habitat                                | Yes | Essential Fish Habitat is not located within the watershed. The nearest Essential Fish Habitat is found approximately 40 miles downstream of the watershed in the Susquehanna River downstream of Conowingo Road in Darlington, MD.                                                                                                                                                                                                         |
| Ecologically Critical Areas                           | Yes | Natural Heritage Area Core Habitat can be found in riparian areas throughout the watershed.                                                                                                                                                                                                                                                                                                                                                 |
| Invasive Species                                      | Yes | Various invasive plant species were identified at many locations within the riparian corridors.                                                                                                                                                                                                                                                                                                                                             |
| Fish and Wildlife                                     | Yes | T&E and/or rare species were identified at some locations within the watershed and are known to inhabit the riparian                                                                                                                                                                                                                                                                                                                        |

|                                                                       |     |                                                                                                                                                                                                                                                                |
|-----------------------------------------------------------------------|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                       |     | corridor. Coordination with the appropriate agencies may be necessary.                                                                                                                                                                                         |
| Natural Areas                                                         | No  | Designated Natural Areas are not found within the watershed.                                                                                                                                                                                                   |
| Riparian Areas                                                        | Yes | Legacy sediment is found in riparian areas.                                                                                                                                                                                                                    |
| Forest Resources                                                      | Yes | Construction access could require forest resources to be impacted. Forests may have grown over legacy sediment terraces.                                                                                                                                       |
| <b>Human Use-Related Concerns</b>                                     |     |                                                                                                                                                                                                                                                                |
| Cultural Resources and Tribal Consultation                            | Yes | Legacy sediment is found along streams, where there are higher potential archaeological resources to be present. Legacy sediment was caused by the historic damming of streams. Historic mills, dams, and other related structures occur within the watershed. |
| Social Issues                                                         | No  | Social issues related to this plan were not identified.                                                                                                                                                                                                        |
| Local, Regional, and National Economy                                 | Yes | Construction will provide a temporary increase in the local economy.                                                                                                                                                                                           |
| Public Health and Safety                                              | Yes | There are health and safety concerns associated with localized flooding and surface water quality within the watershed.                                                                                                                                        |
| Scenic Beauty                                                         | No  | There are no known unique or distinctive visual elements present within the riparian areas of the watershed.                                                                                                                                                   |
| Parklands (including National Parks, Monuments, and Historical Sites) | Yes | Some local parklands are located within the watershed where legacy sediment terraces were identified.                                                                                                                                                          |
| Significant Scientific Resources                                      | Yes | While the watershed is about 35 percent karst, there are no documented caves or fossil sites within the Chiques Creek watershed. The watershed is located within the Lancaster Seismic Zone within the Ramapo Fault System.                                    |
| Land Use                                                              | Yes | Legacy sediment is present in riparian corridors. Existing land uses of these areas may include agriculture, maintained lawn, parklands, and woodlands.                                                                                                        |

## ENVIRONMENTAL REVIEW & CONSULTATION

The following documents compliance with the National Environmental Policy Act (NEPA) and other relevant environmental laws, executive orders, and regulations.

### NEPA: Consideration of Reasonably Foreseeable Impacts

#### Potentially Affected Environment

##### **Soil Resources**

Legacy sediment terraces have formed throughout the watershed as a result of historic mill dam construction promoting sedimentation within the dammed streams. Legacy sediment terraces have been found to be as great as 7 feet deep in some locations and

cause the stream to be perched above its historic floodplain. Soils within the legacy sediment terraces in the Chiques Creek watershed primarily consist of loams and silt loams. Significant streambank erosion has been identified along many streams, which accounts for more than 60 percent of the estimated total annual sediment load within the watershed. Transport of the material is caused by undercutting the banks in combination with freeze-thaw actions which cause calving of the material. It is estimated that 0.1 acres per year of land within the watershed is eroded away every year.

### ***Prime and Unique Farmland, and Farmland of Statewide or Local Importance***

Agriculture composes a significant portion of the land use within the Chiques Creek watershed. Riparian areas within the watershed contain approximately 674 acres of soils designated as Prime and Unique Farmland and 523 acres of soils designated as Farmland of Statewide or Local Importance (NRCS, 2024b).

### ***Water Resources***

The Chiques Creek watershed contains approximately 300 miles of streams which drain to the Susquehanna River. Streams within the watershed do not currently meet their designated uses due to sediment and nutrient concentrations. Due to legacy sediment terraces, streams are currently perched above their historic floodplains and are disconnected from groundwater flows. Legacy sediment terraces may alter stream flow and reduce channel capacity potentially resulting in localized flooding in the watershed.

### ***Water Quality***

Streams within the Chiques Creek watershed are impaired for aquatic life, swimming and boating, and drinking water due to bacteria and other microbes, sediment, nutrients (nitrogen and/or phosphorous), and turbid water. More than 95 percent of Chiques Creek's overall waterway length fails to meet designated aquatic life status due to nutrients and siltation. Streambank erosion has been identified as the primary cause of impairment within the watershed, as eroded banks contribute to the transport of nutrient-laden sediment to surface waters. Thermal heating of ponded surface waters is also an effect of the in-place mill dams. A summary of 303(d) impairments relevant to the Project is presented below in Table 6. A summary of the designated uses of stream reaches found within the watershed are presented below in Table 7.

**Table 6. 303(d) impairments by relevant parameter (Chiques Creek Watershed)**

| <b>Stream Impairment Parameter</b> | <b>Length of Impaired Stream (mi.)</b> |
|------------------------------------|----------------------------------------|
| Impaired for Aquatic Life          | 224.68                                 |
| Impaired for Potable Water Supply  | 13.51                                  |
| Impaired for Recreational Use      | 103.51                                 |

(PADEP, 2025)

**Table 7. Stream designated uses in the Chiques Creek Watershed**

| <b>Designated Use ID</b> | <b>Designated Use Description</b> | <b>Length of Stream (mi.)</b> |
|--------------------------|-----------------------------------|-------------------------------|
| 1                        | Cold Water Fishes                 | 0.51                          |
| 4                        | High Quality-Cold Water Fishes    | 10.66                         |

|   |                   |       |
|---|-------------------|-------|
| 7 | Trout Stocking    | 74.95 |
| 8 | Warm Water Fishes | 87.37 |

(PADEP, 2025)

### ***Waters of the U.S., Wetlands, and Special Aquatic Sites***

Legacy sediment terraces are immediately adjacent to Waters of the U.S. within the Chiques Creek watershed. Streams within the Chiques Creek watershed experience water quality impairments due to elevated levels of sediments and nutrients, and streambank erosion has been identified as the primary cause of water quality impairments within the watershed.

Wetlands can also be found adjacent to and within the legacy sediment terraces. Based on the U.S. Fish and Wildlife (USFWS) National Wetlands Inventory, riparian areas of the watershed contain freshwater emergent wetlands, freshwater forested/shrub wetlands, and freshwater ponds. A summary of the wetland areas found within riparian areas is presented below in Table 8.

**Table 8. Wetlands in riparian areas in the Chiques Creek Watershed**

| <b>Wetland Type</b>       | <b>Acres within Watershed</b> | <b>Acres within Riparian Areas</b> |
|---------------------------|-------------------------------|------------------------------------|
| Freshwater Emergent       | 92.3                          | 64.5                               |
| Freshwater Forested/Shrub | 169.4                         | 122.7                              |
| Freshwater Pond           | 192.8                         | 13.1                               |

(USFWS, 2019)

### ***Regional Water Resource Plans***

Several regional water resources plans encompass the Chiques Creek watershed, including the Chesapeake Bay Total Mass Daily Load (TMDL), PADEP Watershed Restoration Action Strategy (WRAS), SRBC Watershed Alternative Restoration Plan, USACE Comprehensive Water Resources and Restoration Plan, and Little Chiques Creek Watershed Rivers Conservation Plan. These plans provide a framework for meeting regional goals related to water quality improvements, habitat improvements, flood risk reduction, and stormwater management.

### ***Air Quality***

Lancaster County is currently in attainment status for particulate matter 2.5 (2006). However, the County is not in attainment for the 8-hour ozone (2008). The 8-hour ozone nonattainment classification is marginal and encompasses all of Lancaster County. Lebanon County is in attainment status for all criteria pollutants (EPA, 2023).

### ***Bald and Golden Eagles***

Bald eagles are often seen within the Chiques Creek watershed, including reported occurrences in the riparian areas of Chiques Creek. Riparian areas of the watershed may provide habitat and food sources for bald eagles. Bald eagles may be encountered in the watershed year-round, with their breeding season being from January to July. Golden eagles may use riparian areas within the Chiques Creek watershed for respite during migration in late winter/early spring and fall, but their probability of presence is low. Golden eagles are not known to breed within the watershed (USFWS, n.d.).

### ***Essential Fish Habitat***

The Chiques Creek watershed does not contain Essential Fish Habitat. However, approximately 35 miles downstream of the Chiques Creek watershed in the Susquehanna River, Essential Fish Habitat can be found downstream of Conowingo Road in Darlington, MD (National Oceanic and Atmospheric Administration [NOAA], 2024).

### ***Ecologically Critical Areas***

The following Pennsylvania Natural Heritage Program (PNHP) Core Habitat within Natural Heritage Areas can be found within riparian areas of the watershed:

- The Chiques Creek Bluff, located along Chiques Creek between Old Harrisburg Pike and Bridge Valley Road, contains limestone outcrops that support population of jeweled shooting star, a State listed threatened plant species.
- Indian Springs, located along Chiques Creek between just upstream of the confluence with Dellinger Run, provides habitat for an invertebrate species of concern. The focus of conservation for this species is the protection of groundwater quality.
- Chiques Creek and its tributaries north of Manheim Borough to the PA Turnpike contain various types of wetlands that support several species of concern.
- The Penryn Park and Walnut Run core habitat encompasses the tributary to Shearers Creek and provides habitat for 10 species of concern. Vegetation clearing along utility rights-of-way provides favorable habitat for these species.
- The Chiques Creek headwaters north of the PA Turnpike contain large expanses of forest that provide habitat for interior forest dwelling species. This area also provides habitat for one plant species of concern.
- Chickies Rock Park along Chiques Creek at the confluence with the Susquehanna River contains mostly forested habitat for two plant species of concern (PNHP, n.d.).

### ***Fish and Wildlife***

Several stream reaches within the Chiques Creek watershed support natural trout reproduction including: Boyer Run from the headwaters to the PA Turnpike, Behm Run from the headwaters to the PA Turnpike, the unnamed tributary to Shearers Creek from the headwaters to the confluence with Shearers Creek at river mile 2.67, and Shearers Creek from the headwaters to the confluence with Chiques Creek. The upstream portion of Shearers Creek in Lebanon County is also designated as a Class A stream, which supports a natural population of brown trout in significant size and abundance to provide long-term sport fishery (PNHP, n.d.).

Of the 53 mill dams historically present in the watershed, 46 have been breached and seven remain intact. These mill dams have disconnected the stream channel from the historic floodplain, impeding fish migration. The dams within the watershed are lower

priority for removal because other dams downstream prevent anadromous fish passage (USACE, 2021). A figure showing the breached and existing mill dams within the watershed is included in Appendix C.

The Chiques Creek watershed historically provided spawning sites for American shad. However, human activities, specifically the construction of dams, have prevented these migratory fish from accessing the watershed.

### ***Riparian Areas***

Legacy sediment terraces are located within riparian areas of the Chiques Creek watershed. The Chiques Creek watershed contains approximately 6,078 acres (9.50 sq. mi.) of riparian areas. Riparian areas in the watershed often lack quality vegetation and habitat due to agricultural encroachments. Many riparian areas have also been found to contain invasive plant species. Most riparian areas lack significant forest cover.

### ***Forest Resources***

Approximately 29 percent of riparian areas within the Chiques Creek watershed are composed of forest. The forests within riparian areas are primarily deciduous (approximately 24 percent), with some areas containing mixed forests (approximately 5 percent) (USGS, 2024).

The terrestrial ecosystems found within riparian areas within the Chiques Creek watershed are composed of Northeastern Interior Dry-Mesic Oak Forest, Appalachian Hemlock-Northern Hardwood Forest, North-Central Interior and Appalachian Rich Swamp, North-Central Appalachian Acidic Swamp, Laurentian-Acadian Freshwater Marsh, and Dry Oak-Pine Forest Central Appalachians and Southern Piedmont (Pennsylvania Game Commission and Pennsylvania Fish and Boat Commission, 2024).

### ***Cultural Resources and Tribal Consultation***

The Chiques Creek watershed may possess areas of cultural importance for the following Native American Tribes: Absentee Shawnee Tribe of Indians of Oklahoma, Delaware Nation, Delaware Tribe of Indians, Eastern Shawnee Tribe of Oklahoma, and Shawnee Tribe.

Historic properties can be found throughout the Chiques Creek watershed. Historic properties within the watershed that are listed on the National Register of Historic Places (NRHP) are presented below in Table 9. Three historic mill sites determined eligible for listing on the NRHP and containing in-place dams have been identified within the watershed. Figures showing all existing historic properties within the watershed and the location of mill sites within the watershed are included in Appendix C.

**Table 9. National Register of Historic Places listed resources in the Chiques Creek Watershed**

| <b>Name</b>                                 | <b>Type</b> | <b>Eligibility</b> |
|---------------------------------------------|-------------|--------------------|
| John Berger & Son Company Tobacco Warehouse | Building    | Listed             |
| Forry's Mill Covered Bridge                 | Bridge      | Listed             |
| Flowers House                               | Building    | Listed             |
| Shenk's Mill Covered Bridge                 | Bridge      | Listed             |
| Mumma, Samuel N., Tobacco Warehouse         | Building    | Listed             |

|                                                   |          |        |
|---------------------------------------------------|----------|--------|
| Mount Hope Estate                                 | Building | Listed |
| Shearer's Covered Bridge                          | Bridge   | Listed |
| Seigrist's Mill Covered Bridge                    | Bridge   | Listed |
| Central Hotel                                     | Building | Listed |
| Kaufman's Distillery Covered Bridge               | Bridge   | Listed |
| Not Available                                     | Building | Listed |
| Danner Store                                      | Building | Listed |
| Brown's, George, Sons Cotton & Woolen Mill        | Building | Listed |
| William Noggle & Sons, Inc. Shirt Factory         | Building | Listed |
| D.W. Long Tobacco Warehouse                       | Building | Listed |
| Manheim Public School (Stiegel Elementary School) | Building | Listed |

(PA-SHARE, 2025)

### ***Local, Regional, and National Economy***

The Chiques Creek watershed lies primarily within Lancaster County, with a small portion of the watershed being within Lebanon County to the north. Economic data for Lancaster County and Lebanon County are presented below in Table 10.

**Table 10. Income and poverty rates in Lancaster County and**

| <b>Indicator</b>        | <b>Lancaster County</b> | <b>Lebanon County</b> | <b>Pennsylvania</b> | <b>U.S.</b> |
|-------------------------|-------------------------|-----------------------|---------------------|-------------|
| Median Household Income | \$83,703                | \$76,350              | \$76,081            | \$78,538    |
| Per Capita Income       | \$41,319                | \$37,701              | \$43,104            | \$43,289    |
| Persons in Poverty      | 8.6%                    | 8.7%                  | 12.0%               | 11.1%       |

(U.S. Census Bureau, 2023)

### ***Public Health and Safety***

Localized flooding commonly occurs within the Chiques Creek watershed, resulting in public health and safety risks to communities.

### ***Parklands (Including National Parks, Monuments, and Historic Sites)***

There are no national parks, monuments, or historic sites located within riparian areas of the watershed. However, streams within the watershed flow through several local parks, which are presented below in Table 11.

**Table 11. Parks adjacent to streams within the Chiques Creek Watershed**

| <b>Park Name</b>               | <b>Address</b>                                 |
|--------------------------------|------------------------------------------------|
| Cove Outlook Park              | 405 Old Market St, Mt. Joy, PA 17552           |
| Little Chiques Park            | 207 Park Ave, Mt. Joy, PA 17552                |
| Logan Park                     | 536 W Ferdinand St, Manheim, PA 17545          |
| Manheim Veterans Memorial Park | 320 Memorial Dr, Manheim, PA 17545             |
| Chickies Rock County Park      | 880 Old Chickies Hill Rd, Columbia, PA 17512   |
| Grubb Lake Park                | 671 Hempfield Hill Rd, Columbia, PA 17512      |
| Mummau Park                    | 446-498 W Chestnut St, Manheim, PA 17545       |
| Penn Township Park             | 309 Cedar Hollow, Manheim, PA 17545            |
| Bridge Valley Park             | Dahlia Ct, Mt. Joy, PA 17552                   |
| Wolgemuth Park                 | 8741 Elizabethtown Rd, Elizabethtown, PA 17022 |
| Rotary Park                    | 436 Old Market St, Mt. Joy, PA 17552           |
| Chickies Creek Day Use Area    | 1467 Long Ln, Columbia, PA 17515               |

(PNHP, n.d.)

### **Significant Scientific Resources**

No documented caves or fossil sites have been identified within the watershed. However, the watershed is composed of approximately 35 percent karst geology.

The watershed is located in the Lancaster Seismic Zone within the Ramapo Fault System. This seismic area is considered currently active and experiences frequent, small earthquakes ranging from 1 to 4.5 on the Richter Scale.

### **Land Use**

Agriculture (pasture/hay and cultivated crops) is the primary land use with the riparian corridors of the Chiques Creek watershed, accounting for nearly 50 percent of land use within the riparian corridors. A summary of all land uses found within the riparian corridors of the watershed is presented below in Table 12.

**Table 12. Land uses within riparian corridors in the Chiques Creek Watershed**

| <b>Land Use Description</b>  | <b>Area (Acres)</b> | <b>Total Riparian Area (Percent)</b> |
|------------------------------|---------------------|--------------------------------------|
| Pasture/Hay                  | 1,108               | 29.1                                 |
| Deciduous Forest             | 931                 | 24.4                                 |
| Cultivated Crops             | 735                 | 19.3                                 |
| Woody Wetlands               | 324                 | 8.5                                  |
| Developed, Open Space        | 262                 | 6.9                                  |
| Mixed Forest                 | 190                 | 5.0                                  |
| Developed, Low Intensity     | 182                 | 4.8                                  |
| Developed, Medium Intensity  | 29                  | 0.7                                  |
| Shrub/Scrub                  | 22                  | 0.6                                  |
| Open Water                   | 11                  | 0.3                                  |
| Emergent Herbaceous Wetlands | 7                   | 0.2                                  |
| Developed, High Intensity    | 6                   | 0.1                                  |
| Grassland/Herbaceous         | 3                   | 0.1                                  |

(USGS, 2024)

### **Environmental Impacts**

The following section discusses the impacts to resources of concern associated with the No Action Alternative and Alternative 1 – Legacy Sediment Treatment Program.

#### **Soil Resources**

##### **No Action Alternative**

Bank erosion will continue to exacerbate siltation throughout the watershed. Freeze-thaw conditions and storm events will intensify the erosion of legacy sediment, contributing to excess sediment and nutrients to the stream reach. Land will continue to be lost due to erosion at a rate of 0.1 acres per year.

Determination: The No Action Alternative will have direct long-term adverse impacts to soil resources in the watershed.

##### **Alternative 1**

Construction of Streambank and Shoreline Protection (CPS 580) projects may result in short-term adverse impacts to soil resources due to compaction by the construction equipment.

Installation of Riparian Forested Buffers (CPS 391), Riparian Herbaceous Cover (CPS 390) or Streambank and Shoreline Protection (CPS 580) will stabilize streambanks and prevent the loss of land due to streambank erosion.

Aquatic Organism Passage (CPS 396) and Channel Bed Stabilization (CPS 584) may be used to remove the legacy sediment terrace and stabilize a new low-flow stream channel. Removing the legacy sediment will result in the restoration of the historic floodplain soils. These practices and Streambank and Shoreline Protection (CPS 580) will result in preventing the transport of nutrient-laden sediments downstream in the short- and long-term.

A legacy sediment treatment program can reduce the land lost due to erosion by 0.1 acres per year.

Determination: While there may be minor short-term adverse effects to soil resources due to construction, Alternative 1 would have a major positive direct effect on soil resources in the long-term.

### ***Prime and Unique Farmland, and Farmland of Statewide or Local Importance***

#### **No Action Alternative**

Soils within the stream corridor designated as Prime Farmland and Farmland of Statewide importance will continue to erode due to excessive bank erosion. Over time, excessive erosion may result in the loss of agricultural land adjacent to the stream corridor.

Determination: The No Action Alternative will have direct long-term adverse impacts to Prime and Unique Farmland and Farmland of Statewide or local Importance in the watershed.

#### **Alternative 1**

Installation of Riparian Forested Buffers (CPS 391), Riparian Herbaceous Cover (CPS 390), or Streambank and Shoreline Protection (CPS 580) will stabilize streambanks and limit the loss of Prime and Unique Farmlands adjacent to the stream corridor.

Aquatic Organism Passage (CPS 396) may be used to remove the legacy sediment terrace, which may result in a reduction in floodwater velocity facing adjacent farmlands. Aquatic Organism Passage (CPS 396) and Channel Bed Stabilization (CPS 584) may be used to remove the legacy sediment terrace and stabilize a new low-flow stream channel. Removing the legacy sediment will result in the restoration of the historic floodplain soils. These practices and Streambank and Shoreline Protection (CPS 580) will result in preventing the transport of nutrient-laden sediments downstream in the short- and long-term.

Determination: Alternative 1 would have long-term, indirect beneficial effects on Prime Farmland and Farmland of Statewide importance by reducing erosion of farmland soils and reducing flood risks for farmland adjacent to streams. Long-term, direct adverse effects to Prime Farmland and Farmland of Statewide Importance will occur for projects that convert agricultural land to natural floodplains.

## **Water Resources**

### **No Action Alternative**

Legacy sediment terraces will continue to impact streams by reducing channel capacity, altering stream flow, and degrading water quality.

Determination: The No Action Alternative will have direct long-term adverse impacts to water resources in the watershed.

### **Alternative 1**

Remove existing mill dams using Obstruction Removal (CPS 500) across the stream to restore free-flowing conditions. Thermal impacts due to solar radiation of slow-moving water will decrease. Aquatic Organism Passage (CPS 396) may be used in combination with Channel Bed Stabilization (CPS 584) and CPS 500 or as a stand-alone practice, to remove the legacy sediment terrace. This may result in restoring the native floodplain, uncovering historic cold-water springs and seeps, and decreased downstream flooding.

Installation of Riparian Forested Buffers (CPS 391) and Riparian Herbaceous Cover (CPS 390) will stabilize the streambank, shade streams reducing water temperatures, filter nutrients, and increase groundwater storage throughout the watershed.

Streambank and Shoreline Protection (CPS 580) will minimize the amount of bank erosion leading to an increase in water quality through decreased nutrients and sedimentation throughout the stream. These practices may decrease the sedimentation and nutrient concentrations enough to all the streams to meet their designated use status.

Adverse effects of sediment loss during construction would be minimized and mitigated by implementing the appropriate best management practices.

Determination: While Alternative 1 may have short-term minor adverse effects during construction, it would have a major direct, beneficial long-term effect on water resources.

## **Water Quality**

### **No Action Alternative**

Unrestrained bank erosion will continue to result in the transport of nutrients and sediment to surface waters, further degrading water quality within and downstream of the watershed. The Chiques Creek watershed is estimated to contribute 70 million lbs./yr of nutrient-laden sediment into the Chesapeake Bay.

Determination: The No Action Alternative will have long-term direct adverse impacts on water quality in the watershed.

### **Alternative 1**

Removing existing mill dams using Obstruction Removal (CPS 500) will prevent mass erosion of the submerged sediment and legacy sediment terraces if the dams were to fail on their own.

Full implementation of Alternative 1 will reduce the annual load of nutrient-laden legacy sediment within the surface waters by at least 1,025 tons/year.

Implementation of Aquatic Organism Passage (CPS 396) and Channel Bed Stabilization (CPS 584) with or without Obstruction Removal (CPS 500) will remove the terraces formed by sediment accumulation behind historic mill dams and allow the natural movement of aquatic organisms upstream. These practices will reduce the buildup of nutrient-laden sediment within the water column and promote ecological diversity throughout the stream, leading to an increase in water quality. The one-time sediment removal benefit is estimated to be at least 26,240 tons (29,111 cubic yards). Removing the legacy sediment terraces may expose historic cold-water springs. This surfacing of groundwater can decrease the temperature of streams (USGS, 2014). Construction of this practice may result in a short-term release of sediment to surface waters which will be mitigated by implementation of best management practices.

Riparian Forested Buffers (CPS 391) and Riparian Herbaceous Cover (CPS 390) can absorb excess nutrients from farm and livestock operations. Installation of riparian forest buffer and herbaceous cover will increase the ability of the riparian corridor to naturally filter surface water.

Streambank and Shoreline Protection (CPS 580) will secure the sediment such that it will not contribute to bank erosion or the degradation of water quality.

Determination: Alternative 1 may have short-term, adverse impacts to water quality during construction; however, this will be mitigated using best management practices for erosion and sedimentation control. Overall, Alternative 1 would have long-term direct, beneficial effects on water quality within and downstream of the watershed.

### ***Waters of the U.S., Wetlands, & Special Aquatic Sites***

#### **No Action Alternative**

Waters of the U.S. and wetlands will continue to be impacted by the presence of legacy sediment terraces by having streams disconnected from their historic floodplain, altering stream flows, and reducing channel capacity.

Determination: The No Action Alternative will have long-term, direct adverse effects on Waters of the U.S. and wetlands.

#### **Alternative 1**

Implementation of Obstruction Removal (CPS 500) can remove mill dams which accumulate sediment and lead to the formation of legacy sediment terraces. Construction of this practice may result in a short-term release of sediment to surface waters which will be mitigated by implementation of best management practices.

Aquatic Organism Passage (CPS 396) can be used to remove the legacy sediment, adversely impacting existing wetlands. However, the sediment removal can lead to the reconnecting of streams to their historic floodplain and exposures of historic higher-quality floodplain wetlands.

Riparian Forested Buffers (CPS 391) and Riparian Herbaceous Cover (CPS 390) can assist in stabilizing the streambank, filtering pollutants, and enhancing existing lower-quality wetlands.

Streambank and Shoreline Protection (CPS 580) will decrease the amount of legacy sediment present throughout the stream due to erosion, enhancing water quality.

Determination: Alternative 1 would have major long-term, direct beneficial effects by reducing erosion and sedimentation, reconnecting streams and wetlands to historic floodplains, and improving aquatic organism passage. Wetlands may experience short-term, adverse impacts through the removal of legacy sediment terraces, but the long-term improvements are expected to outweigh these adverse effects.

### ***Regional Water Resource Plans***

#### **No Action Alternative**

The goals presented in the Chesapeake Bay TMDL, PADEP WRAS, SRBC Watershed Alternative Restoration Plan, and Little Chiques Creek Watershed Rivers Conservation Plan are unlikely to be achieved.

Determination: The No Action Alternative will have long-term adverse impacts on regional water resource plans.

#### **Alternative 1**

Installation of Aquatic Organism Passage (CPS 396) and Channel Bed Stabilization (CPS 584) will reduce the risk of flooding by restoring natural stream and floodplain connectivity. CPS 396 removes or modifies in-stream barriers that confine high flows, allowing water to spread into adjacent low-lying areas. CPS 584 stabilizes the channel bed and banks, reducing erosion that disconnects the stream from the floodplain. These practices increase the effective floodplain width, slow channel flow, and lower peak flooding, aligning with the goals presented in the Chesapeake Bay TMDL, SRBC Watershed Alternative Restoration Plan, and Little Chiques Creek Watershed Rivers Conservation Plan..

Streambank and Shoreline Protection (CPS 580), Riparian Forested Buffers (CPS 391), and Riparian Herbaceous Cover (CPS 390) can reduce bank erosion and the amount of sediment throughout the stream, leading to improvements in water quality in support of the regional water resource plans.

Determination: Alternative 1 would have a minor, direct, beneficial effect on regional water resource plans by reducing the annual load of nutrient-laden legacy sediment delivered by Chiques Creek into Chesapeake Bay by approximately 2.2%, improving the quality of streams, and reducing flood risks. These improvements meet the goals presented in the Chesapeake Bay TMDL, PADEP WRAS, SRBC Watershed Alternative Restoration Plan, USACE Comprehensive Water Resources and Restoration Plan, and Little Chiques Creek Watershed Rivers Conservation Plan.

## ***Air Quality***

### **No Action Alternative**

Impacts to air quality are not expected. Lancaster County is likely to remain in attainment status for particulate matter and in nonattainment status for 8-hour (2008) ozone.

Determination: The No Action Alternative will have no impact on air quality.

### **Alternative 1**

Implementation of the core conservation practices may have short-term localized adverse impacts to air quality due to construction. Installation of Riparian Forested Buffers (CPS 391) and Riparian Herbaceous Cover (CPS 390) can have long-term benefits to air quality through the increase in carbon sequestration offered by enhancing plant communities within riparian areas.

Determination: Alternative 1 would have short-term adverse effects on air quality during construction, and long-term benefits associated with increased carbon sequestration.

## ***Bald and Golden Eagles***

### **No Action Alternative**

Water quality impairments could adversely impact fish populations within the watershed, which may limit food sources for bald eagles.

Determination: The No Action Alternative will have long-term, indirect adverse effects to bald and golden eagles.

### **Alternative 1**

Implementation of Obstruction Removal (CPS 500) by removing mill dams will enhance the diversity of fish populations throughout the stream, as the removal of the dams will allow fish to travel upstream which will increase food sources for bald eagles.

Installation Riparian Forested Buffers (CPS 391) and Riparian Herbaceous Cover (CPS 390) would increase habitats for bald eagles and their potential food sources throughout the riparian corridor. Trees planted as part of the forested buffer may become a nest tree for the bald eagle.

Streambank and Shoreline Protection (CPS 580) will stabilize streambanks and reduce erosion and water quality degradation such that the health and fitness of bald eagles and their food sources will not be at risk.

Determination: Alternative 1 would have beneficial long-term, indirect effects on bald eagles, as the proposed conservation practices will provide improved habitat and foraging opportunities.

## ***Essential Fish Habitat***

### **No Action Alternative**

Sediments and nutrients transported to surface waters may adversely impact essential fish habitat downstream of the watershed.

Determination: The No Action Alternative will have long-term, direct adverse effects on essential fish habitats.

### **Alternative 1**

Removal of mill dams using Obstruction Removal (CPS 500) will allow fish to travel upstream and enhance the diversity of aquatic ecosystems along the stream, benefiting the biodiversity of essential fish habitat downstream of the watershed.

The other conservation practices will stabilize and remove legacy sediment from the riparian corridor, preventing streambank erosion. This will prevent downstream transportation of nutrient-laden sediment and enhance water quality which benefits the essential fish habitat located downstream of the watershed.

Construction of these practices may result in a short-term release of sediment to surface waters which will be mitigated by implementation of best management practices.

Determination: Alternative 1 would have a minor, indirect beneficial effect on the essential fish habitat, as the proposed reduction of sediment transport and prevention of legacy sediment terrace formation may benefit aquatic life downstream of the watershed.

## ***Ecologically Critical Areas***

### **No Action Alternative**

Natural Heritage Areas located within riparian areas of the watershed may be adversely impacted by the presence of eroding legacy sediment terraces. Threats to habitat include water quality impairments, streambank erosion, and the disconnection of groundwater flows to the stream corridor.

Determination: The No Action Alternative will have long-term, indirect adverse impacts on Natural Heritage Areas.

### **Alternative 1**

Implementation of the various planned conservation practices will improve water quality by stabilizing or removing nutrient-laden legacy sediment. Removing legacy sediment can strengthen the connection of groundwater flows to stream corridors and benefit the Natural Heritage Areas. Floodplain and wetland habitat can be improved by removing invasive species and introducing native species to riparian areas.

Construction of these practices may result in a short-term release of sediment to surface waters which will be mitigated by implementation of best management practices. Coordination with the partnering agencies of the PNHP will be completed to develop appropriate designs and minimize adverse effects during construction.

Determination: Alternative 1 would have long-term, indirect beneficial effects due to the proposed restoration of riparian areas and wildlife habitats. Short-term, direct adverse effects may be experienced during construction.

### ***Invasive Species***

### ***Fish and Wildlife***

#### **No Action Alternative**

Water quality impairments from excess sediments and nutrients will adversely impact aquatic wildlife.

Determination: The No Action Alternative will have long-term, indirect adverse effects on fish and wildlife.

#### **Alternative 1**

Removal of mill dams using Obstruction Removal (CPS 500) will allow the diverse stock of fish to migrate throughout Chiques Creek, increasing the number of aquatic habitats for feeding, breeding, and shelter and diversifying ecosystems throughout the stream. Removal of mill dams will also help with restoring fish passage for anadromous species, such as the American shad. However, fish passage to the Chiques Creek watershed will still be restricted by dams downstream on the Susquehanna River.

Aquatic Organism Passage (CPS 396) may be used in combination with Channel Bed Stabilization (CPS 584), or as a stand-alone practice, to remove the legacy sediment terrace which can restore and reconnect the stream to the native floodplain. Cold-water seeps and springs may be uncovered that may decrease the temperature of surface waters and improve the water quality for fish and aquatic wildlife within and downstream of the watershed. Channel Bed Stabilization (CPS 584) can also be used to enhance in-stream habitat.

Riparian Forested Buffers (CPS 391) and Riparian Herbaceous Cover (CPS 390) can filter and absorb excess nutrients from farm and livestock operations, preventing agricultural runoff and its pollutants from entering the stream and harming fish and aquatic life. These practices will also benefit wildlife throughout the stream and riparian corridor by removing invasive species, introducing native species, and providing habitats for a diversity of wildlife.

Construction of some of these practices may result in a short-term release of sediment to surface waters which will be mitigated by implementation of best management practices.

Determination: Alternative 1 would have long-term, direct beneficial effects by increasing habitats for aquatic life throughout the watershed, removing invasive species, and introducing native species throughout the riparian corridor. Short-term, adverse effects may be experienced during construction; however, best management practices will be used to mitigate any adverse impacts.

## ***Riparian Areas***

### **No Action Alternative**

Legacy sediment will remain present in riparian areas. Erosion along the bank will continue or worsen, destabilizing the riparian areas and potentially leading to tree collapse. Continued streambank erosion puts the quality of riparian habitats at risk.

Determination: The No Action Alternative will have long-term, direct adverse effects to riparian areas.

### **Alternative 1**

Implementation of Obstruction Removal (CPS 500) can restore free-flowing streams by removing mill dams. Aquatic Organism Passage (CPS 396) may be used in combination, or as a stand-alone practice, to remove the legacy sediment terrace which can result in restoring and reconnecting the stream to the native floodplain.

Streambank and Shoreline Protection (CPS 580) will utilize structural, bioengineered, and vegetative measures to hold sediment in-place and decrease streambank erosion, minimizing the risk of decreasing the quality of riparian habitats.

Native plantings used for Riparian Forested Buffers (CPS 391) and Riparian Herbaceous Cover (CPS 390) would introduce woody and non-woody vegetation and native species along riparian corridors, stabilizing riparian areas and benefiting wildlife habitats. Buffers would also prevent encroachment by agriculture in these areas. Exclusion fencing could be used with CPS 390 and CPS 391 to prevent livestock grazing of riparian areas.

Determination: Alternative 1 would have long-term, direct beneficial effects due to the proposed increase in vegetative cover throughout the riparian corridor and decreased erosion.

## ***Forest Resources***

### **No Action Alternative**

Excessive streambank erosion could lead to tree collapse. Agricultural encroachments on riparian areas will continue to limit forest resources.

Determination: The No Action Alternative will have long-term, indirect adverse effects on forest resources.

### **Alternative 1**

Implementing Riparian Forested Buffers (CPS 391) would introduce woody native vegetation, stabilizing riparian areas and benefiting wildlife habitats. Buffers would also prevent encroachment by agriculture in these areas. If used, CPS 391 will increase the footprint of forests within the riparian corridor. Agricultural encroachments on riparian areas may continue, but supporting conservation practices, such as installing a Fence (CPS 382), can be implemented to limit potential impacts.

Determination: Alternative 1 would have long-term, direct beneficial effects due to the proposed reduction of bank erosion and loss of land, as well as an increase in vegetative cover throughout the riparian corridor.

## ***Cultural Resources and Tribal Consultation***

### **No Action Alternative**

No new ground disturbance or modification of historic properties would occur, resulting in no direct effects on cultural resources or tribal interests. However, existing conditions such as channel instability, erosion, and flooding would continue, which could indirectly contribute to the gradual degradation or loss of historic resources over time. During extreme flood events, historic mill dams and associated structures could be undercut or lost, releasing retained sediment downstream and substantially increasing channel incision and the potential loss of historic properties. Cumulatively, the absence of watershed restoration could increase long-term risks to cultural resources.

Determination: The No Action Alternative will have minor, indirect, adverse effects on cultural resources.

### **Alternative 1**

Implementation of Obstruction Removal (CPS 500) will remove historic mill dams which contribute to the accumulation of legacy sediment throughout the stream. Due to the age and historic use of the dam, it may be considered NRHP-eligible, and removal would be considered an adverse effect.

Aquatic Organism Passage (CPS 396) will remove deposited legacy sediment along the stream corridor. By restoring the native floodplain, this practice may reduce flooding to downstream cultural resources. Streambank and Shoreline Protection (CPS 580), Riparian Forested Buffers (CPS 391), and Riparian Herbaceous Cover (CPS 390) will be used to stabilize the streambank, decreasing the risk of erosion of historic sites and archaeological resources within the watershed. These practices do have the potential to adversely affect existing cultural resources, including the historic viewshed.

Ground disturbance required to implement land treatment practices could potentially impact cultural resources. As the area of potential effect is refined, consultation with the PASHPO and Tribes with ancestral land claims will be required. Consultation with the PASHPO and Federally recognized Tribes with ancestral land claims will be completed for each project site as per the terms of the Programmatic Agreement to avoid, minimize, and mitigate effects to cultural and tribal resources.

The Undertaking consists of corridors covering large land areas. NRCS cannot fully determine effects to historic properties prior to receiving applications that identify which producers/properties will participate so identification of historic properties has not been fully completed. Thus, NRCS is phasing identification and evaluation of historic properties and application of the criteria of adverse effect in accordance with 36 CFR 800.4(b)(2) and 36 CFR 800.5(a)(3), respectively by implementing a Programmatic Agreement.

Determination: Alternative 1 has the potential to have long-term, direct, adverse effects on cultural and tribal resources. However, coordination with the PASHPO and Federally recognized Tribes with ancestral land claims will minimize any adverse effects.

## ***Local, Regional, and National Economy***

### **No Action Alternative**

The local and regional economy may be impacted by localized flooding within the Chiques Creek watershed. Water quality impairments may also impact recreational uses within the stream corridors, which could have impacts to the local economy by limiting tourism in the area. These potential impacts to flooding and tourism are not expected to affect the national economy due to being localized to the watershed.

Determination: The No Action Alternative will have long-term, indirect adverse effects on the local economy, and no impacts on the national economy.

### **Alternative 1**

Implementation of Obstruction Removal (CPS 500) will allow fish to travel upstream, enhancing biodiversity of aquatic organisms and ecosystem connectivity which allows species to access various habitats for feeding, breeding, and shelter. Aquatic Organism Passage (CPS 396) may be used in combination, or as a stand-alone practice, to remove the legacy sediment terrace which can result in restoring and reconnecting the stream to the native floodplain. This increased diversity can draw tourism and create more desirable locations for fishing throughout the watershed. Removing dams as well as exposing historic springs and seeps can also decrease the thermal effects on the streams resulting in higher quality, lower temperature streams.

Restoring stream channel capacity will also reduce the risk of flooding in riparian areas, further increasing recreational opportunities and lowering costs of flood damages.

Riparian Forested Buffers (CPS 391), Riparian Herbaceous Cover (CPS 390), and Streambank and Shoreline Protection (CPS 580) will prevent the loss of land adjacent to streambanks preventing erosion. This reduction in sediment may have a positive effect on water treatment plant intakes below the watershed.

Installation of land treatment practices will require material and labor for construction, which will have effects on the local and regional economy and allows for potential job creation. It is estimated that Alternative 1 would result in the creation of 20 jobs per year during the 10 years construction is assumed to take place, and regional direct and indirect income benefits of almost \$4,000,000 per year based on research of economic benefits offered by non-urban stream restoration projects in the Chesapeake Bay watershed (Chesapeake Bay Foundation, 2022).

Due to the scale of the project, impacts on the national economy are not expected.

Determination: Alternative 1 would have long-term and short-term, indirect beneficial effects on the local and regional economy due to the potential enhancement of property values and tourism opportunities from streambank protection measures, mitigation of flood risks, and increases in jobs and economic outputs during construction. There will be no impact on the national economy.

## ***Public Health and Safety***

### **No Action Alternative**

Flooding will continue to serve as a low-level threat to habitats along the riparian corridor as well as localized areas within the watershed. Water quality will continue to be adversely affected by sedimentation and nutrients.

Determination: The No Action Alternative will have long-term, direct adverse effects on public health and safety.

### **Alternative 1**

Removing mill dams using Obstruction Removal (CPS 500) will prevent the risk of flooding caused by a potential breach of the structure.

Using Aquatic Organism Passage (CPS 396) to remove legacy sediment can expose the historic floodplains, reducing flooding in adjacent riparian areas and their communities.

Installation of Riparian Forested Buffers (CPS 391) and Riparian Herbaceous Cover (CPS 390) would naturally filter out pollutants from urban and agricultural runoff. This may improve local and downstream waters for swimming, boating, and fishing.

Determination: Alternative 1 would have long-term, indirect beneficial effects on public health and safety, as the Legacy Sediment Treatment Program will mitigate flood risks in surrounding communities and decrease erosion to enhance the water quality of the stream.

## ***Parklands (including National Parks, Monuments, and Historic Sites)***

### **No Action Alternative**

Parklands adjacent to streams may experience streambank erosion and flooding due to legacy sediment terraces limiting channel capacity and altering stream flow.

Determination: The No Action Alternative will have long-term, direct adverse effects on parklands adjacent to streams.

### **Alternative 1**

Implementation of Obstruction Removal (CPS 500) can remove mill dams and restore free-flowing streams. This can increase fish diversity in parklands above the mill dams.

Aquatic Organism Passage (CPS 396) can remove legacy sediment and restore the native floodplain capacity and natural channel flow, reducing the risk of flooding in riparian areas and parklands adjacent to streams.

Installation of Riparian Forested Buffers (CPS 391) and Riparian Herbaceous Cover (CPS 390) would support diverse plant and animal life, enriching the ecological and aesthetic value of adjacent parklands.

Determination: Alternative 1 would have long-term, indirect beneficial effects on parklands throughout the watershed, as the proposed restoration of stream channel capacity and installation of riparian forest buffer will mitigate flood risks to surrounding areas.

## ***Significant Scientific Resources***

### **No Action Alternative**

Impacts to karst features or faults within the watershed are not expected.

Determination: There will be no impact to significant scientific resources.

### **Alternative 1**

Implementation of the proposed conservation practices are not expected to have impacts on significant scientific resources. Karst features in the watershed have the potential to form caves; however, the installation of conservation practices is not expected to affect karst geology or the formation of caves. Seismic activity in the watershed is not anticipated to have an effect on any of the proposed conservation practices.

Determination: Alternative 1 would have no effect on significant scientific resources.

## ***Land Use***

### **No Action Alternative**

Agriculture will continue to be the primary land use within the riparian corridors.

Determination: The No Action Alternative will have no impacts to land use.

### **Alternative 1**

It is not expected that implementation of Obstruction Removal (CPS 500) at sites of mill dams would change the current land use in those locations.

Aquatic Organism Passage (CPS 396), Riparian Forested Buffers (CPS 391), and Riparian Herbaceous Cover (CPS 390) may cause a conversion of the existing agricultural land use to forest, wetland, grassland, or scrub/shrub areas. Assuming a 50-foot buffer along the at least 21,900 linear feet of stream projects that are expected to be installed with this program, approximately 25 acres of land will be converted.

Determination: Alternative 1 would have long-term, direct beneficial effects on land use due to the conversion of existing land use within riparian areas to natural ecosystems that increase the health of streams.

## **Environmental Impacts Summary**

Environmental impacts of proposed action (Legacy Sediment Treatment Program) and No Action are summarized in Table 13.

**Table 13. Summary and comparison of alternatives – effects on resource concerns (Chiques Creek Watershed Project)**

| <b>Resource Concern</b>                                                  | <b>No Action Alternative</b>                                                                                                                                      | <b>Alternative 1 – Legacy Sediment Treatment Program</b>                                                                                                                                                                                                                                                                                                                                          |
|--------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Soil Resources                                                           | The No Action Alternative will have direct long-term adverse impacts to soil resources in the watershed due to continued erosion.                                 | While there may be minor short-term adverse effects to soil resources due to construction, Alternative 1 would have a major positive direct effect on soil resources in the long-term by reducing streambank erosion.                                                                                                                                                                             |
| Prime and Unique Farmland, and Farmland of Statewide or Local Importance | The No Action Alternative will have direct long-term adverse impacts to Prime and Unique Farmland and Farmland of Statewide or Local Importance in the watershed. | Alternative 1 would have long-term, indirect beneficial effects on Prime Farmland and Farmland of Statewide importance by reducing erosion of farmland soils and reducing flood risks for farmland adjacent to streams. Long-term, direct adverse effects to Prime Farmland and Farmland of Statewide Importance will occur for projects that convert agricultural land to natural floodplains.   |
| Water Resources                                                          | The No Action Alternative will have direct long-term adverse impacts to water resources in the watershed.                                                         | While Alternative 1 may have short-term minor adverse effects during construction, it would have a major direct, beneficial long-term effect on water resources.                                                                                                                                                                                                                                  |
| Water Quality                                                            | The No Action Alternative will have long-term direct adverse impacts on water quality in the watershed.                                                           | Alternative 1 may have short-term, adverse impacts to water quality during construction; however, this will be mitigated using best management practices for erosion and sedimentation control. Overall, Alternative 1 would have long-term direct, beneficial effects on water quality within and downstream of the watershed.                                                                   |
| Floodplain Management                                                    | The No Action Alternative will have long-term, direct adverse impacts to floodplain management.                                                                   | Alternative 1 would have a long-term, direct beneficial effects on floodplain management.                                                                                                                                                                                                                                                                                                         |
| Waters of the U.S., Wetlands, & Special Aquatic Sites                    | The No Action Alternative will have long-term, direct adverse effects on Waters of the U.S. and wetlands.                                                         | Alternative 1 would have major long-term, direct beneficial effects by reducing erosion and sedimentation, reconnecting streams and wetlands to historic floodplains, and improving aquatic organism passage. Wetlands may experience short-term, adverse impacts through the removal of legacy sediment terraces, but the long-term improvements are expected to outweigh these adverse effects. |
| Regional Water Resource Plans                                            | The No Action Alternative will have long-term adverse impacts on regional water resource plans.                                                                   | Alternative 1 would have a minor direct, beneficial effect on regional water resource plans by reducing the annual load of nutrient-laden legacy sediment from the watershed, improving the                                                                                                                                                                                                       |

| <b>Resource Concern</b>                 | <b>No Action Alternative</b>                                                                       | <b>Alternative 1 – Legacy Sediment Treatment Program</b>                                                                                                                                                                                                                             |
|-----------------------------------------|----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                         |                                                                                                    | quality of streams, and reducing flood risks to meet the goals presented in the Chesapeake Bay TMDL, PADEP WRAS, SRBC Watershed Alternative Restoration Plan, USACE Comprehensive Water Resources and Restoration Plan, and Little Chiques Creek Watershed Rivers Conservation Plan. |
| Air Quality                             | The No Action Alternative will have no impact on air quality.                                      | Alternative 1 would have short-term adverse effects on air quality during construction, and long-term benefits associated with increased carbon sequestration.                                                                                                                       |
| Threatened and Endangered (T&E) Species | The No Action Alternative will have long-term, adverse impacts to T&E species.                     | Alternative 1 would have long-term, beneficial effects on aquatic and terrestrial habitats for T&E species. Any short-term adverse effects will be minimized through agency coordination and the use of best management practices.                                                   |
| Migratory Birds                         | The No Action Alternative is not expected to have impacts on migratory birds.                      | Alternative 1 would have long-term, indirect beneficial effects on migratory birds, as the proposed conservation practices will improve habitat.                                                                                                                                     |
| Bald and Golden Eagles                  | The No Action Alternative will have long-term, indirect adverse effects to bald and golden eagles. | Alternative 1 would have long-term, indirect effects on bald eagles, as the proposed conservation practices will provide improved habitat and foraging opportunities.                                                                                                                |
| Essential Fish Habitat                  | The No Action Alternative will have long-term, direct adverse effects on essential fish habitats.  | Alternative 1 would have a minor, indirect beneficial effect on the essential fish habitat as the proposed reduction of sediment transport and prevention of legacy sediment terrace formation may benefit aquatic life downstream of the watershed.                                 |
| Ecologically Critical Areas             | The No Action Alternative will have long-term, indirect adverse impacts on Natural Heritage Areas. | Alternative 1 would have long-term, indirect beneficial effects due to the proposed restoration of riparian areas and wildlife habitats. Short-term, direct adverse effects may be experienced during construction.                                                                  |
| Invasive Species                        | The No Action Alternative will have long-term, indirect adverse effects on invasive species.       | Alternative 1 would have long-term, direct beneficial effects such as the removal of invasive species along the riparian corridor and will limit the threat of their spreading to other areas of the watershed.                                                                      |
| Fish and Wildlife                       | The No Action Alternative will have long-term, indirect adverse effects on fish and wildlife.      | Alternative 1 would have long-term, direct beneficial effects by increasing habitats for aquatic life throughout the                                                                                                                                                                 |

| <b>Resource Concern</b>                    | <b>No Action Alternative</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>Alternative 1 – Legacy Sediment Treatment Program</b>                                                                                                                                                                                                                                                                                                                                                         |
|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | watershed, removing invasive species, and introducing native species throughout the riparian corridor. Short-term, adverse effects may be experienced during construction; however, best management practices will be used to mitigate any adverse impacts.                                                                                                                                                      |
| Riparian Areas                             | The No Action Alternative will have long-term, direct adverse effects to riparian areas.                                                                                                                                                                                                                                                                                                                                                                                                                                      | Alternative 1 would have long-term, direct beneficial effects due to the proposed increase in vegetative cover throughout the riparian corridor and decreased erosion.                                                                                                                                                                                                                                           |
| Forest Resources                           | The No Action Alternative will have long-term, indirect adverse effects on forest resources.                                                                                                                                                                                                                                                                                                                                                                                                                                  | Alternative 1 would have long-term, direct beneficial effects due to the proposed reduction of bank erosion and loss of land, as well as an increase in vegetative cover throughout the riparian corridor. Agricultural encroachments on riparian areas may continue, but supporting conservation practices can be implemented to limit potential impacts.                                                       |
| Cultural Resources and Tribal Consultation | No adverse effects to NRHP-eligible properties are expected because no new ground disturbance or modification of historic properties would occur; however, continued channel instability, erosion, and flooding—particularly during extreme flood events—could indirectly and cumulatively contribute to the degradation or loss of historic mill dams and associated structures, increased channel incision, downstream sediment release, and long-term risks to cultural resources in the absence of watershed restoration. | Alternative 1 has the potential to have long-term, direct, adverse effects on cultural and tribal resources. However, coordination with the PASHPO and Federally recognized Tribes with ancestral land claims will minimize any adverse effects.                                                                                                                                                                 |
| Local, Regional, and National Economy      | The No Action Alternative will have long-term, indirect adverse effects on the local and regional economy, and there will be no impact on the national economy.                                                                                                                                                                                                                                                                                                                                                               | Alternative 1 would have long-term and short-term, indirect beneficial effects on the local and regional economy due to the potential enhancement of property values and tourism opportunities from streambank protection measures, mitigation of flood risks, and increases in jobs and economic outputs during construction. Impacts to the national economy are not expected due to the scale of the project. |
| Public Health and Safety                   | The No Action Alternative will have long-term, direct adverse effects on public health and safety.                                                                                                                                                                                                                                                                                                                                                                                                                            | Alternative 1 would have long-term, indirect beneficial effects on public health and safety, as the Legacy                                                                                                                                                                                                                                                                                                       |

| Resource Concern                                                    | No Action Alternative                                                                                   | Alternative 1 – Legacy Sediment Treatment Program                                                                                                                                                                                                        |
|---------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                     |                                                                                                         | Sediment Treatment Program will mitigate flood risks in surrounding communities and decrease erosion to enhance the water quality of the stream.                                                                                                         |
| Parklands (including National Parks, Monuments, and Historic Sites) | The No Action Alternative will have long-term, direct adverse effects on parklands adjacent to streams. | Alternative 1 would have long-term, indirect beneficial effects on parklands throughout the watershed, as the proposed restoration of stream channel capacity and installation of riparian forest buffer will mitigate flood risks to surrounding areas. |
| Significant Scientific Resources                                    | There will be no impact to significant scientific resources.                                            | Alternative 1 would have no effect on significant scientific resources.                                                                                                                                                                                  |
| Land Use                                                            | The No Action Alternative will have no impact to land use.                                              | Alternative 1 would have long-term, direct beneficial effects on land use due to the conversion of existing land use within riparian areas to natural ecosystems that increase the health of streams.                                                    |

### Irretrievable Commitment of Federal Resources

The Preferred Alternative would require construction equipment and materials and other energy in the form of labor and fossil fuels. Using these items would be generally irretrievable. A project under the Preferred Alternative would irreversibly impact soil resources and land use, such as in the removal and disposal of legacy sediments from the floodplain. The expenditure of financial resources is irretrievable in the short term, but the investment could be retrieved over the life of the projects by increasing the value of ecological resources at and downstream of the project sites. This commitment will not contribute to a loss of long-term productivity for the human environment.

### Endangered Species Act

As part of USFWS consultation, Pennsylvania Natural Diversity Inventory (PNDI) and Information for Planning and Consultation (IPaC) processes were completed and submitted in June 2025. The PNDI tool is a geospatial species database provided by the PNHP through which projects are submitted for review, and potential project impacts to T&E species are identified. USFWS participates in the development of the tool and acknowledges the PNDI as a component of Section 7 consultation for a project.

Several State and Federally listed T&E species are reported to inhabit the Chiques Creek watershed. Table 14 provides a list of the T&E species that may be encountered within riparian areas of the watershed.

**Table 14. Threatened and Endangered (T&E) species**

| Common Name        | Scientific Name               | State Status | Federal Status |
|--------------------|-------------------------------|--------------|----------------|
| <b>Animals</b>     |                               |              |                |
| Eastern bog turtle | <i>Glyptemys muhlenbergii</i> | Endangered   | Threatened     |

| Common Name             | Scientific Name               | State Status                                     | Federal Status |
|-------------------------|-------------------------------|--------------------------------------------------|----------------|
| Indiana bat             | <i>Myotis sodalis</i>         | Endangered                                       | Endangered     |
| Northern long-eared bat | <i>Myotis septentrionalis</i> | Endangered                                       | Endangered     |
| <b>Plants</b>           |                               |                                                  |                |
| Jeweled shooting star   | <i>Dodecatheon radicum</i>    | Threatened                                       | Not Listed     |
| Torrey's rush           | <i>Juncus torreyi</i>         | Threatened                                       | Not Listed     |
| Virginia bunchflower    | <i>Melanthium virginicum</i>  | Special Concern Species<br>(Proposed Endangered) | Not Listed     |
| Bog bluegrass           | <i>Poa paludigena</i>         | Threatened                                       | Not Listed     |
| Clinton's wood fern     | <i>Dryopteris clintoniana</i> | Special Concern Species<br>(Proposed Threatened) | Not Listed     |
| Bradley's spleenwort    | <i>Asplenium bradleyi</i>     | Endangered                                       | Not Listed     |
| Waterpod (Ellisia)      | <i>Ellisia nyctelea</i>       | Threatened                                       | Not Listed     |

(Pennsylvania Natural Heritage Program, n.d.)

Individual PNDI and IPaC submittals would be required for each project implemented by the preferred alternative. Construction activities on known sites of T&E species have potential to have an adverse effect on the species. Coordination with the proper agencies and best practices will be used to minimize potential adverse effects.

## National Historic Preservation Act – Section 106 Review

The Undertaking consists of corridors covering large land areas. NRCS cannot fully determine effects to historic properties prior to receiving applications that identify which producers/properties will participate so identification of historic properties has not been fully completed. Thus, NRCS is phasing identification and evaluation of historic properties and application of the criteria of adverse effect in accordance with 36 CFR 800.4(b)(2) and 36 CFR 800.5(a)(3), respectively by implementing a Programmatic Agreement.

The Pennsylvania State Historic Preservation Office has reviewed the proposed action and made the following determination:

### Above Ground Resources

We have reviewed the draft Watershed Project Plan and Programmatic Environmental Assessment and look forward to additional consultation under the programmatic agreement.

### Archaeological Resources

Thank you for providing the draft Watershed Plan and Programmatic Environmental Assessment. The Archaeology review does not currently have any comments to provide regarding the draft Watershed Plan and Programmatic Environmental Assessment. We look forward to additional consultation under the programmatic agreement.

## Consultation with Federally Recognized Tribes

The Bureau of Indian Affairs Tribal Leader Directory, Housing and Urban Development Tribal Directory Assessment Tool and the Pennsylvania Department of Transportation's Tribal Consultation website were queried to identify Tribes claiming ancestral land in the

Project area. The consulting list for Federally recognized Tribes was then narrowed based on archival research and publicly available information in the cultural heritage portions of each of the Tribes' websites. The elected leadership of the Absentee Shawnee Tribe of Indians of Oklahoma, Delaware Nation, Delaware Tribe of Indians, Eastern Shawnee Tribe of Oklahoma, and Shawnee Tribe were mailed certified letters requesting participation in the scoping process, alternatives, and development of a phased approach Programmatic Assessment. The appropriate THPOs received carbon copies of the letters via their preferred method of delivery. Except for the Shawnee Tribe, no other Tribes expressed interest in the crafting of alternative procedures. All Tribes shall be consulted on a project-by-project basis as the areas of potential effect are refined through the applicant's approval for participation.

**Table 15: Applicable proposal record documentation to support tribal consultation**

| <b>Documentation Type</b>                                                                             | <b>File Name (if applicable/needed)</b>                            |
|-------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|
| Scoping Invitation Letter (June 30, July 5, 2022)                                                     | Watershed Plan Appendix A, Scoping Meeting Invitation Letters      |
| Alternatives Meeting Invitation Letter (May 30, 2024)                                                 | Watershed Plan Appendix A, Alternatives Meeting Invitation Letters |
| Results of Phase IA, Consultation, and Programmatic Agreement Development Request (February 14, 2025) | Watershed Plan Appendix A, Consultation Letters - Tribes           |
| Request for Concurring Signatures on Programmatic Agreement (February 6, 2026)                        | Watershed Plan Appendix A, Programmatic Agreement Development      |
| Request for Interagency Review of Watershed Plan                                                      | Watershed Plan Appendix A, Interagency Review Letters              |

## **Clean Water Act**

The pertinent subject matter expert has reviewed the proposed action and made the following determination:

Project will affect waters, including wetlands. Modifications/design criteria will be included to ensure compliance with CWA is met. The USACE regulates the deposition of fill into Waters of the US under Section 404 of the Clean Water Act. The Pennsylvania Department of Environmental Protection regulates water obstructions and encroachments under Chapter 105. It is likely that the proposed project would require a permit under Section 404.

The proposed works of improvement are expected to impact existing wetlands within the riparian corridor. Impacts to low quality wetlands can be mitigated by removing invasive species and planting natives to lift in form and function. If the ersatz wetland is destroyed by the removal of legacy sediment, the original, native wetland of higher quality will be uncovered. Proper permitting through PADEP and USACE will be completed to avoid, minimize, and mitigate potential effects on-site wetlands.

During construction, site mitigation measures would include erosion and sediment control, dust control, and other practices identified during the design process. National Pollutant Discharge Elimination System permitting and best management practices during construction would be implemented to minimize the mobilization of the sediment into stream systems.

## Clean Air Act

The project will not result in permanent air emissions and no modifications or further coordination needs to occur to ensure compliance.

## Special Management Area Considerations

There are no Special Management Areas within the Chiques Creek Watershed.

## Pertinent Executive Orders

The applicable subject matter experts have determined the proposed action are in compliance with the following Executive Orders (EO), which were deemed pertinent based on the nature of the proposal:

### ***EO 11988, Floodplain Management***

Legacy sediment terraces are found within the floodplain. Due to the presence of legacy sediment terraces within the stream corridor, streams within the watershed are disconnected from their historic floodplains, which may be buried under several feet of sediment. Legacy sediment terraces have altered stream flow which may contribute to increased flooding in some areas of the watershed. Floodplains often encompass agricultural land, maintained lawn, and woodlands. The watershed contains approximately 6.47 sq. mi. of floodplains. A summary of the flood hazard areas within the watershed are presented below in Table 16.

**Table 16. Flood hazard areas in the Chiques Creek Watershed**

| <b>Flood Hazard Area</b> | <b>Area<br/>(sq. mi.)</b> |
|--------------------------|---------------------------|
| Zone A                   | 3.73                      |
| Zone AE                  | 1.06                      |
| Zone AE (floodway)       | 1.15                      |
| Zone X                   | 0.52                      |

(FEMA, 2016a)

Implementation of the proposed action would have minor, short-term, direct beneficial effects on floodplain management. Removing the legacy sediment terrace can result in restoring and reconnecting the stream to the native floodplain. Installation of Riparian Forested Buffers (CPS 391), Riparian Herbaceous Cover (CPS 390), and Streambank and Shoreline Protection (CPS 580) will hold sediment in-place and reduce the loss of land due to erosion, protecting the existing floodplains and leading to a lower risk of flooding in adjacent agricultural lands and communities. While the proposed action will improve the function and values of floodplains, there will be no change to existing floodplain management provisions.

The No Action Alternative will have long-term, direct adverse impacts to floodplain management. Legacy sediment will remain present in the floodplain and continue to alter stream flow which may lead to localized flooding. Existing floodplain management provisions will continue to regulate development within the floodplain

### **EO 11990, Protection of Wetlands**

The proposed works of improvement are expected to impact existing wetlands within the riparian corridor. A summary of the wetlands present within the riparian corridors of the Chiques Creek watershed is shown in Table 8. An evaluation of existing wetland functions on all accepted project sites will be conducted for any identified wetlands present. Impacts to low-quality wetlands can be mitigated by removing invasive species and planting natives to lift in form and function. If the ersatz wetland is destroyed by the removal of legacy sediment, the original, native wetland of higher quality will be uncovered. Proper permitting through PADEP and USACE will be completed to avoid, minimize, and mitigate potential effects on-site wetlands.

The proposed action would have major long-term, direct beneficial effects by reducing erosion and sedimentation, reconnecting streams and wetlands to historic floodplains, and improving aquatic organism passage. Wetlands may experience short-term, adverse impacts through the removal of legacy sediment terraces, but the long-term improvements are expected to outweigh these adverse effects.

The No Action Alternative will have long-term, direct adverse effects on Waters of the U.S. and wetlands. Wetlands within the riparian corridor will continue to be impacted by the presence of legacy sediment terraces by having streams disconnected from their historic floodplain, altering stream flows, and reducing channel capacity.

### **EO 13007, Indian Sacred Sites – Not Applicable**

### **EO 13112, Invasive Species**

Several invasive plant species were identified within riparian areas during field investigations of the Chiques Creek watershed. A list of the commonly encountered invasive species identified in the field are provided in Table 17.

**Table 17. Invasive species identified within the Chiques Creek Watershed**

| <b>Common Name</b>   | <b>Scientific Name</b>      |
|----------------------|-----------------------------|
| Garlic mustard       | <i>Alliaria petiolata</i>   |
| Multiflora rose      | <i>Rosa multiflora</i>      |
| Poison hemlock       | <i>Conium maculatum</i>     |
| Amur honeysuckle     | <i>Lonicera maackii</i>     |
| Reed canary grass    | <i>Phalaris arundinacea</i> |
| Japanese honeysuckle | <i>Lonicera japonica</i>    |
| Common chickweed     | <i>Stellaria media</i>      |

The proposed action would have long-term, direct beneficial effects as the removal of invasive species along the riparian corridor will limit the threat of spreading to other areas of the watershed. The invasive species will be removed in areas where these conservation practices will be implemented. The disturbed sites will be planted with native species. If properly maintained, the native species will outcompete invasive species.

The No Action Alternative will have long-term, indirect adverse effects on invasive species. Invasive species within riparian corridors may spread to other areas of the

watershed. Livestock access to riparian corridors may potentially introduce new invasive species through seed dispersal on their coats or in the manure.

### **EO 13186, Migratory Birds**

Riparian corridors within the Chiques Creek watershed provide habitat and respite for a multitude of migratory bird species. Migratory bird species that may be encountered within the watershed are presented in Table 18 below.

**Table 18. Migratory birds within the Chiques Creek Watershed**

| <b>Common Name</b>    | <b>Scientific Name</b>                   |
|-----------------------|------------------------------------------|
| Bald Eagle            | <i>Haliaeetus leucocephalus</i>          |
| Golden Eagle          | <i>Aquila chrysaetos</i>                 |
| Black-billed Cuckoo   | <i>Coccyzus erythrophthalmus</i>         |
| Cerulean Warbler      | <i>Setophaga cerulea</i>                 |
| Chimney Swift         | <i>Chaetura pelagica</i>                 |
| Kentucky Warbler      | <i>Geothlypis formosa</i>                |
| Prairie Warbler       | <i>Setophaga discolor</i>                |
| Prothonotary Warbler  | <i>Protonotaria citrea</i>               |
| Red-headed Woodpecker | <i>Melanerpes erythrocephalus</i>        |
| Wood Thrush           | <i>Hylocichla mustelina</i>              |
| Grasshopper Sparrow   | <i>Ammodramus savannarum perpallidus</i> |
| Rusty Blackbird       | <i>Euphagus carolinus</i>                |

(USFWS, n.d.)

The proposed action would have long-term, indirect beneficial effects on migratory birds, as the proposed conservation practices will improve habitat for migratory birds. Implementation of Obstruction Removal (CPS 500) by removing mill dams will allow aquatic organisms to travel upstream, creating opportunities for new habitats that could potentially attract migratory birds to more portions of the stream. Aquatic Organism Passage (CPS 396) may be used to remove legacy sediment and increase water quality, lowering the risk of adverse effects on migratory birds throughout the stream. Native floodplain wetland habitat can be restored. Installation of Riparian Forested Buffers (CPS 391) and Riparian Herbaceous Cover (CPS 390) will benefit wildlife throughout the stream and riparian corridor through the removal of invasive species and introduction of native species, increasing the diversity of ecosystems and migratory bird habitat throughout the watershed.

There may be minimal short-term effects to habitat and respite for migratory birds due to construction of conservation practices.

The No Action Alternative is not expected to have impacts on migratory birds

### **EO 13443, Facilitation of Hunting Heritage and Wildlife Conservation**

Streams and riparian corridors within the Chiques Creek watershed provide opportunities for recreational use, such as fishing, hunting, trapping, bird watching, and other forms of passive recreation.

Streams within the Chiques Creek watershed support wild and stocked fish populations that provide opportunities for recreational fishing. Little Chiques Creek and its tributaries have designated uses for trout stocking, Chiques Creek and its tributaries

have designated uses for warm-water fishes, and Shearers Creek and its tributaries have designated uses for high-quality cold-water fishes (PNHP, n.d.).

There are two State Game Lands located in the northern portion of the watershed managed by the Pennsylvania Game Commission. State Game Lands 145 encompasses a portion of the unnamed tributary to Little Chiques Creek, and State Game Lands 156 encompasses the northern portion of Behms Run and Boyers Run (PNHP, n.d.).

Downstream of the Chiques Creek watershed, the Susquehanna River and Chesapeake Bay are both used for recreational fishing, boating, and swimming.

In accordance with EO 13443, the Pennsylvania Game Commission and Pennsylvania Fish and Boat Commission were consulted. They offered no comments to incorporate into the EA and Plan.

The proposed action would have long-term, indirect beneficial effects on recreational use throughout the watershed, as the proposed land treatment practices will enhance wildlife habitat and increase desirability for fishing, boating, trapping, and bird watching. Implementation of Obstruction Removal (CPS 500) will remove any mill dams to allow fish to travel upstream to increase connectivity, enhancing fishing and boating opportunities throughout Chiques Creek. Aquatic Organism Passage (CPS 396) will remove legacy sediment, restoring native habitat which can benefit wildlife that support recreational activities such as fishing, hunting, and bird watching. Riparian Forested Buffers (CPS 391) and Riparian Herbaceous Cover (CPS 390) would increase vegetation and remove invasive species, enhancing habitats for wildlife within the riparian corridor and making the watershed more desirable for recreational use.

### **Certifying Statement for EA Page Limit and Deadline**

The Responsible Official certifies that this EA:

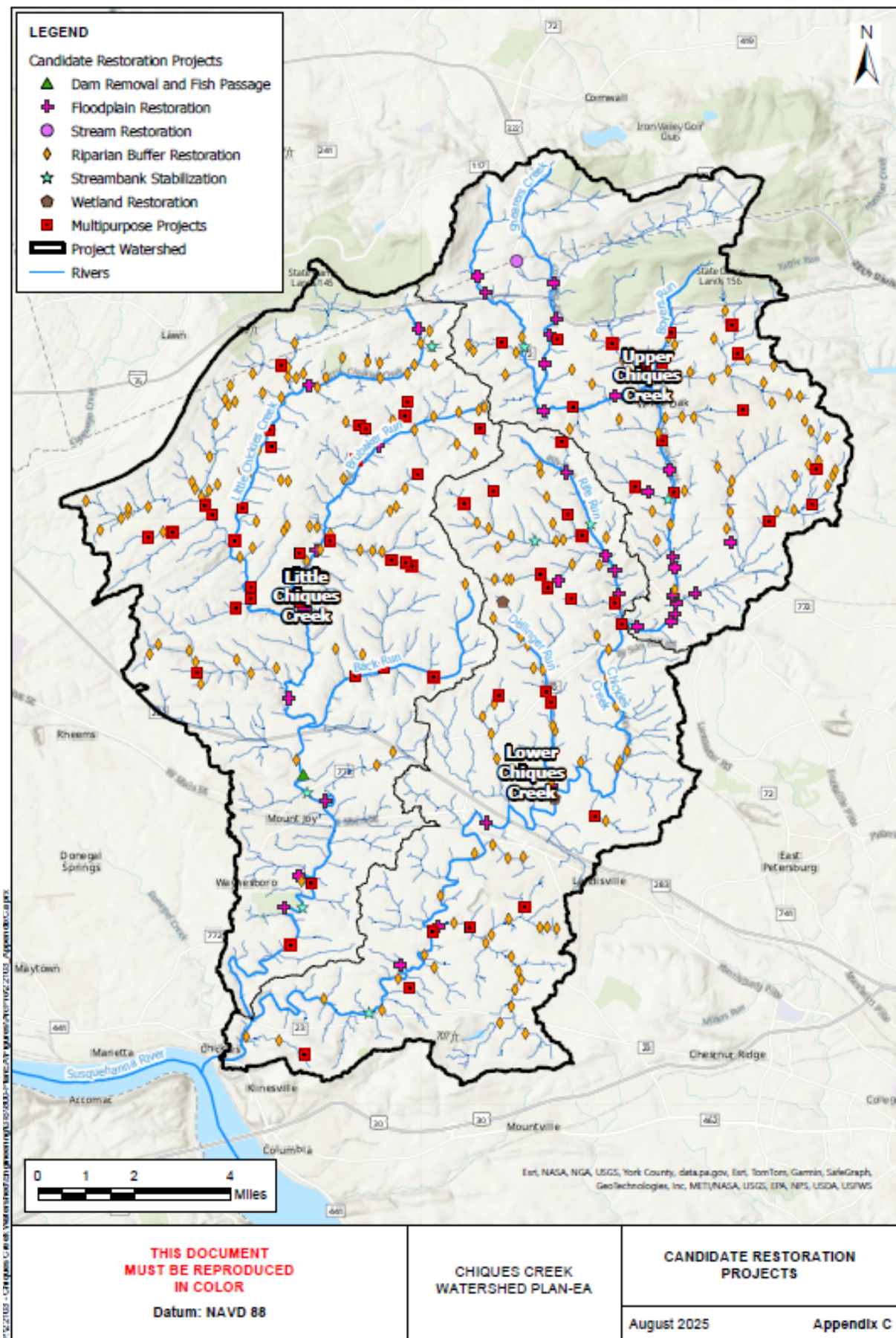
- ☒ Demonstrates the agency has thoroughly considered the factors mandated by NEPA;
- ☒ Represents the agency's good-faith effort to prioritize documentation of the substantive issues and most important considerations required by NEPA within the congressionally mandated page limits;
- ☒ Reflects the agency's expert judgment;
- ☒ Addressed briefly, or left unaddressed, any issues or considerations that were, in the agency's judgment, comparatively not of a substantive nature;
- ☒ Represents the agency's good-faith effort to fulfill NEPA's requirements within the Congressional timeline (or within the minimally extended timeline) and this effort is substantially complete; and
- ☒ Contains analysis that is adequate to inform and reasonably explain the responsible official's final decision regarding the proposed action or selected alternative.

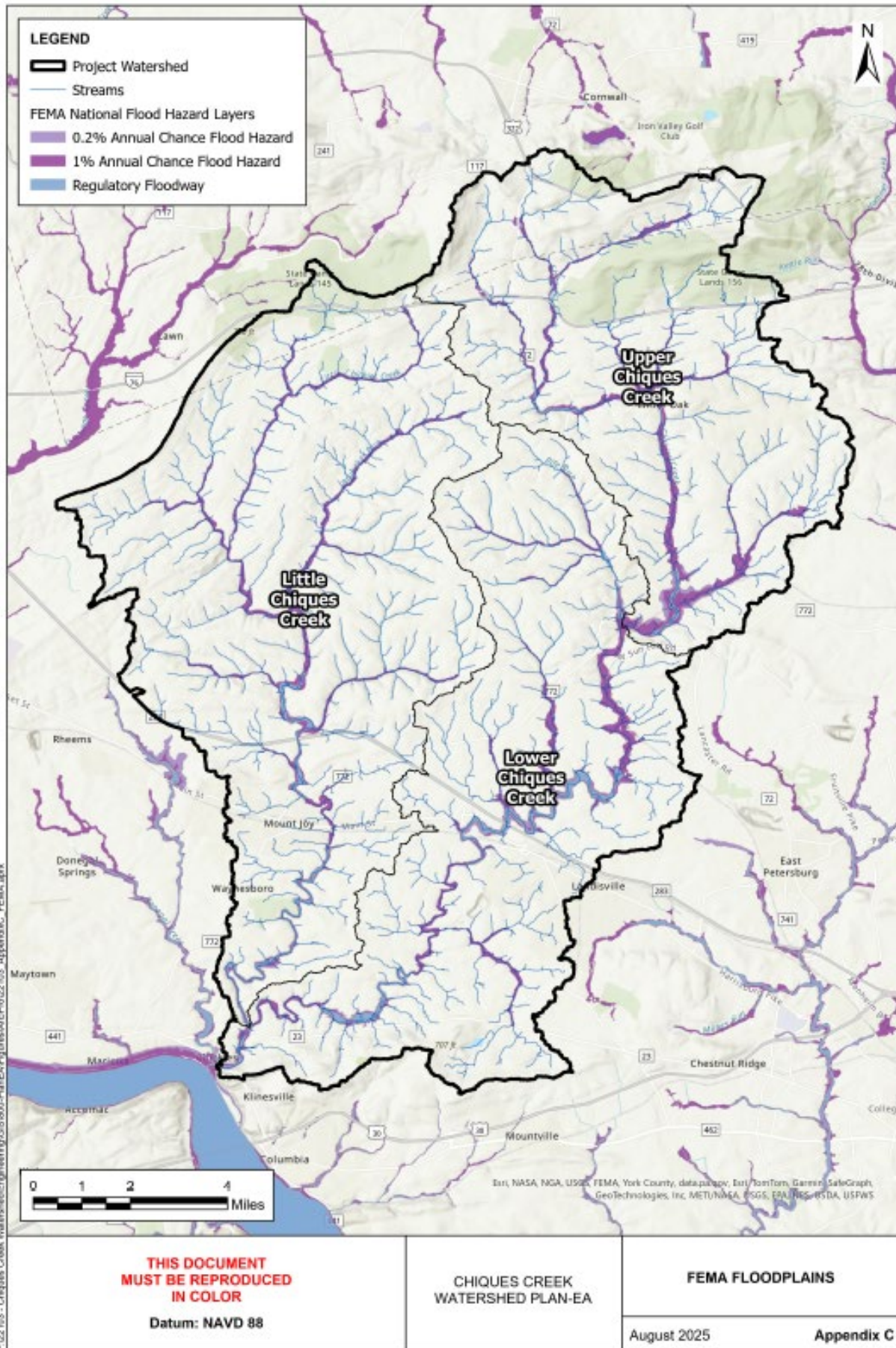
## APPENDICES

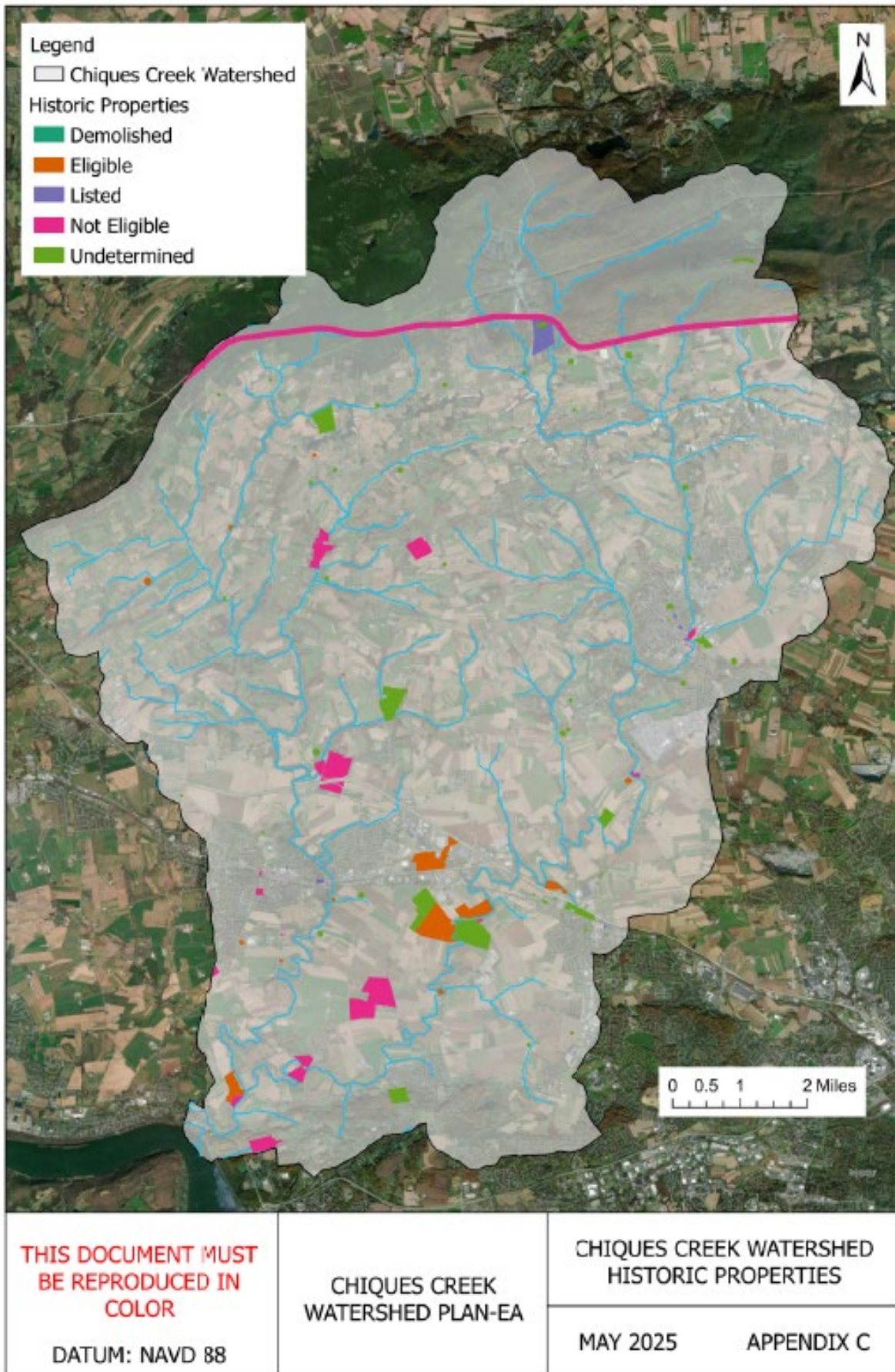
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- Watershed Project Map
- Map of Chiques Creek Watershed showing Candidate Restoration Projects
- Map of Chiques Creek Watershed showing FEMA Floodplains
- Map of Chiques Creek Watershed showing Historic Properties
- Map of Chiques Creek Watershed showing Legacy Sediment Terrace Locations
- Map of Chiques Creek Watershed showing Historic and Existing Mill Dam sites
- Map of Chiques Creek Watershed 303(D) Listed Streams (Impaired for Aquatic Life)
- Map of Chiques Creek Watershed 303(D) Listed Streams (Impaired for Potable Water Supply)
- Map of Chiques Creek Watershed 303(D) Listed Streams (Impaired for Recreational Use)

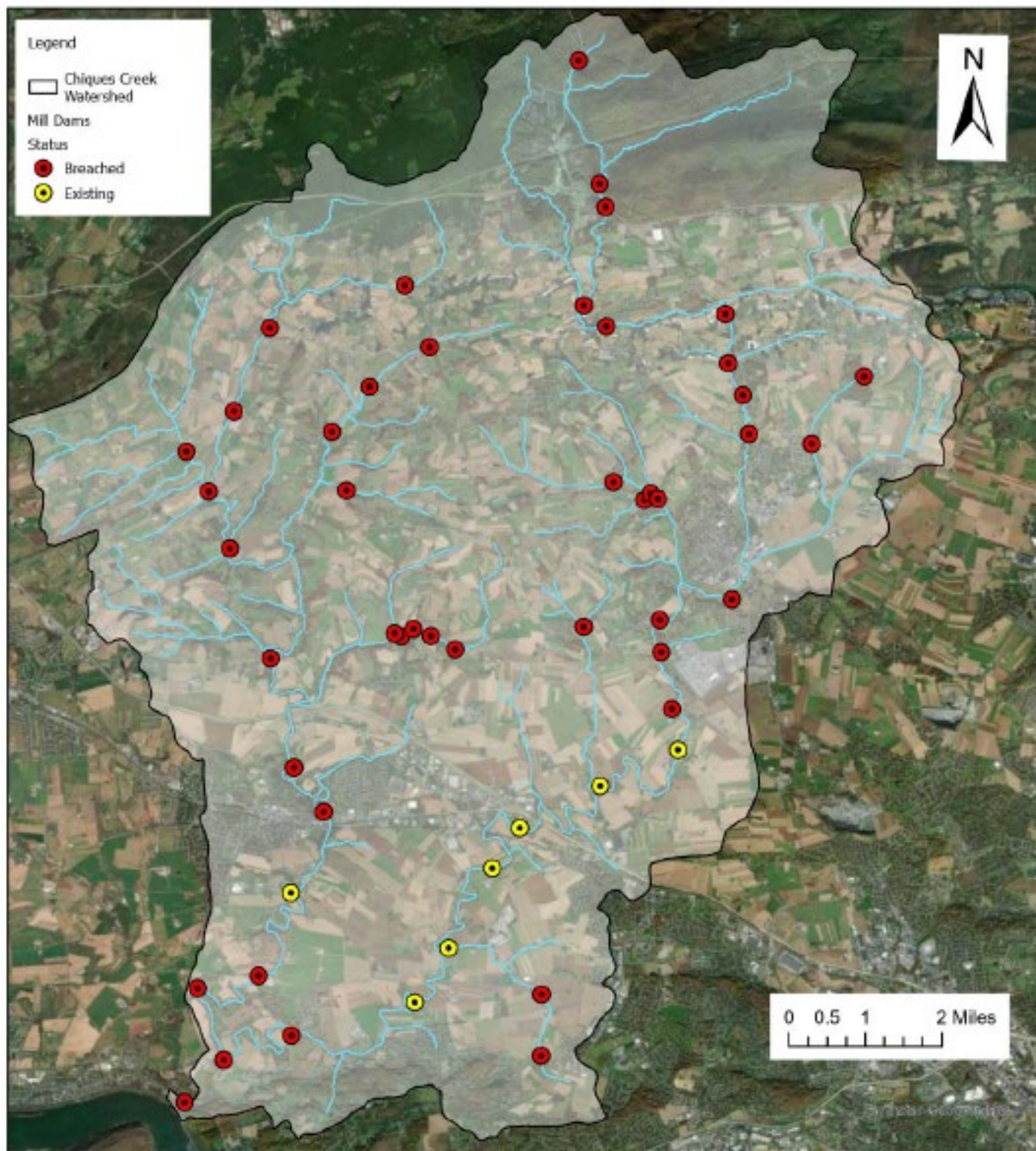












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REPRODUCED IN COLOR**

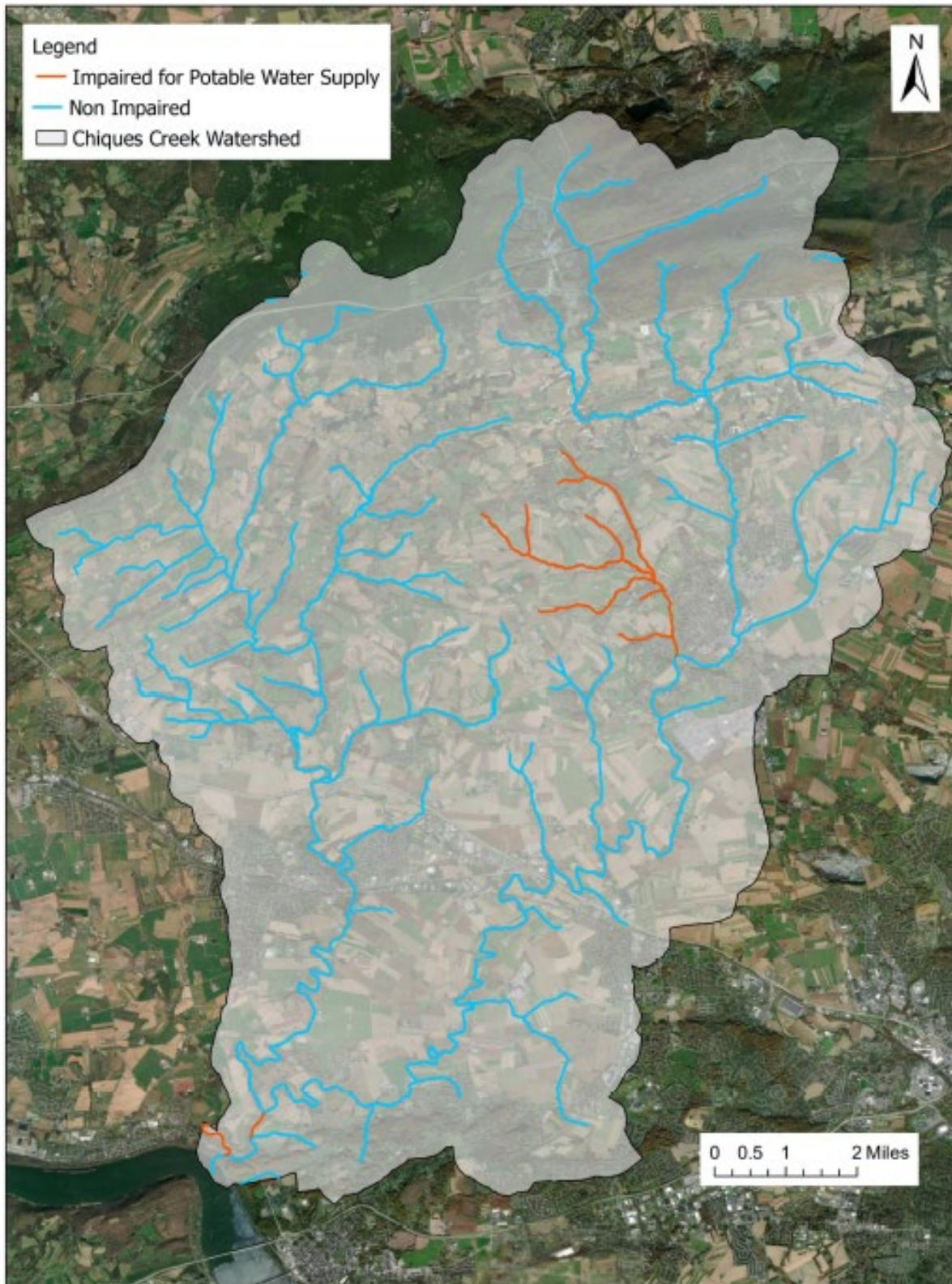
DATUM: NAVD 88

CHIQUES CREEK  
WATERSHED PLAN EA

CHIQUES CREEK  
WATERSHED MILL SITES

MAY 2025 APPENDIX C





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COLOR**

DATUM: NAVD 88

CHIQES CREEK  
WATERSHED PLAN-EA

CHIQES CREEK WATERSHED  
303(D) LISTED STREAMS

MAY 2025

APPENDIX C



## FINDING OF NO SIGNIFICANT IMPACT (FONSI)

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**Proposal Name:** Legacy Sediment Removal in the Chiques Creek Watershed in Lancaster County, Pennsylvania

**Proposal Tracking #:** PEAX-005-53-042-1214289995

**Agency Name:** United States Department of Agriculture, Natural Resources Conservation Service

**Unit Name:** Pennsylvania State Office

### Documentation Informing the FONSI

This Finding of No Significant Impact incorporates the Environmental Assessment and relies on documentation in the associated proposal record.

### Activities Approved

I have decided to approve the proposed action as described in the [“Proposal Information”](#) section of the Environmental Assessment.

### Determination of No Significant Impacts

I have determined no significant impacts are anticipated for the activities approved based on the discussion provided under the [“NEPA: Consideration of Significant Impacts”](#) section, and as informed by other analysis and determinations provided in the [“Environmental Review”](#) section of the Environmental Assessment.

The EA evaluated both the beneficial and adverse impacts of the proposed action, which is the authorization of funds to administer a watershed protection program offering technical and financial assistance for water quality improvement projects at legacy sediment sites. As summarized in [“NEPA: Consideration of Reasonably Foreseeable Impacts”](#) section, the proposed action’s environmental benefits would outweigh the potential environmental costs of the program, which would be temporary and occur primarily during construction of individual treatment projects. Impacts to cultural and socio-economic resources would be primarily positive and minimized by project-specific systems to reduce impacts. Long-term impacts of the projects over the project life would outweigh the short-term, adverse impacts of construction. Overall, the program is estimated to result in long-term beneficial impacts to water quality, wildlife habitat, natural areas (including wetland restoration), and other ecosystem services; and reduce flooding and negative stormwater impacts.

The proposed action would have major long-term, direct beneficial effects by reducing erosion and sedimentation, reconnecting streams and wetlands to historic floodplains, and improving aquatic organism passage. Wetlands may experience short-term, adverse impacts through the removal of legacy sediment terraces, but the long-term improvements are expected to outweigh these adverse effects.

A cultural resources inventory of the area of potential effects (APE) was undertaken. The NRCS has consulted with the Pennsylvania State Historic Preservation Officer (PA-

SHPO), the Absentee Shawnee Tribe of Indians of Oklahoma, Delaware Nation, Delaware Tribe of Indians, Eastern Shawnee Tribe of Oklahoma, and Shawnee Tribe and has reached concurrence that no historic property will be adversely affected. If cultural resources are inadvertently discovered during implementation, NRCS will follow procedures as detailed in the State-level agreement between the PA-SHPO and PA-NRCS.

The recommended action is not anticipated to have adverse long-term effects on fish and wildlife habitat, floodplains, migratory birds, park lands, prime farmlands, rare, threatened, and endangered species of plants and animals, scenic beauty, wild and scenic rivers, or ecologically critical areas.

No threatened or endangered species in the watershed will be affected by the project.

The effects of the recommended action are not considered highly uncertain nor involve unique or unknown risks.

The project is not of National Significance and implementing the proposed alternative will not establish a precedent for future actions with significant effects, nor does it represent a decision in principle about future considerations.

The proposed action will not violate Federal, State, or local law requirements imposed for protection of the environment. Consultations required by the Magnuson-Stevens Fishery Conservation and Management Act, Endangered Species Act, National Historic Preservation Act, and Marine Mammal Protection Act have been completed. The recommended action is consistent with the requirements of these laws. The local sponsors will obtain any necessary permits before they begin implementation of the project.

The recommended action will not result in significant adverse cumulative impacts. The cumulative effects of this project are very positive for protection of downstream loss of life and property. The planned action is the most practical, complete, and acceptable means of protecting life and property of downstream residents. There are no significant negative short-term or long-term environmental or human impacts associated with the implementation of this action.

The action alternative would require construction equipment and materials and other energy in the form of labor and fossil fuels. Using these items would be generally irretrievable. A project under the Preferred Alternative would irreversibly impact soil resources and land use, such as in the removal and disposal of legacy sediments from the floodplain. The expenditure of financial resources is irretrievable in the short term, but the investment could be retrieved over the life of the projects by increasing the value of ecological resources at and downstream of the project sites.

### **Anticipated Implementation of Authorized Activities**

I intend to implement the approved activities started in approximately 1 year from authorization, depending on funding availability. Following authorization, design and construction phase funding will be requested. The implementation is expected to take five to ten years.

## Signature and Authorization Date

Denise Coleman

Pennsylvania State Conservationist

Date: \_\_\_\_\_.

DENISE COLEMAN

Digitally signed by DENISE COLEMAN

Date: 2026.08.24 13:39:52 -04'00'