

# Environmental Assessment

## Cresson AMD Treatment Plant

Cambria and Blair Counties, Pennsylvania

Developed by:

Pennsylvania Department of Environmental Protection

Bureau of Conservation and Restoration

Cambria Office

September 2015

## **A. DESCRIPTION OF THE PROPOSED ACTION**

The Pennsylvania Department of Environmental Protection (PADEP) is planning to use funding from Pennsylvania's Capital Budget fund, supplemented by Pennsylvania's AMD Set Aside Program to address mine drainage problems in the headwaters of Clearfield Creek and Sugar Run. This environmental assessment (EA) serves as an analysis of the environmental consequences of the approval, and alternative to approval for constructing an acid mine drainage (AMD) treatment facility near Cresson, PA.

This EA is being used to fulfill the National Park Service (NPS) National Environmental Policy Act (NEPA) requirements and has been prepared in accordance with the requirements of the National Environmental Policy Act of 1969, as amended and its implementing regulations (40 CFR 1500-1508), and NPS Director's Order #12, Conservation Planning, Environmental Impact Analysis, and Decision-Making (DO-12, 2011) and accompanying DO-12 Handbook (2001).

The Cresson AMD Abatement Project proposes to construct an Acid Mine Drainage (AMD) water treatment facility for treatment of mine drainage. The effluent from the plant will then be discharged to the Clearfield Creek watershed. Water will be supplied to the AMD treatment facility by vertical wells installed from the ground surface into three mine pools: Cresson No.9, Gallitzin Shaft and Argyle Stone Bridge. The mine pools formed by the accumulation of water in abandoned coal mine workings are currently the sources of contaminated mine discharges. The Cresson No.9 Mine Pool underlies areas of Cresson Township, Cresson Borough and Sankertown Borough. Water currently discharges from the Cresson Mine Pool through a mine shaft that was installed when the mine was operating. The discharge flows into a tributary of Clearfield Creek, locally called Trapp Run. The Gallitzin Shaft Mine Pool underlies areas of Cresson Township and Gallitzin Township. This mine pool discharges into Bradley Run, another Clearfield Creek tributary, at a site located along SR 53 near the intersection with Chestnut Road. The Argyle Stone Bridge Mine Pool underlies the National Park Service property adjacent to the Allegheny Portage Railroad National Park and areas of Gallitzin Township. This mine pool discharges into Sugar Run, a tributary to the Beaverdam Branch Juniata River (see figure 1 and Figure 2). The objective of this project is two-fold: to eliminate three mine discharges impacting Clearfield Creek and Sugar Run and to provide treated mine water to supplement the Susquehanna River during low-flow conditions. It is anticipated that eliminating

the three discharges described above will restore aquatic life in 15 miles of Clearfield Creek and six miles of Sugar Run that are currently impaired.

### **ALPO Site:**

Allegheny Portage Railroad National Historic Site is in southwestern Pennsylvania in Blair and Cambria Counties. The park protects the cultural resources that comprise the Allegheny Portage Railroad and tells the story of its influence on the nation. The park consists of two separate units extending across 40 miles. The main park unit is at the summit of the original portage, roughly 3 miles east of the town of Cresson. The main unit includes the Visitor Center, Lemon House, Incline 6 and Level 6, the Engine House 6 Ruins and Exhibit Shelter, and Skew Arch Bridge. The eastern slope portion of the main unit is long and narrow, reflecting the original footprint of the portage railroad. This portion contains Inclines and Levels 6–10. The park's Staple Bend Tunnel unit is approximately 16 miles southwest of the main unit and features the first railroad tunnel in the United States.

### **Mine Pools:**

#### Cresson No. 9 Mine Pool

The Cresson No. 9 Mine, located near the headwaters of Clearfield Creek, covers approximately 2,100 acres under the Towns of Cresson and Sankertown. Mining was conducted in both the Upper Freeport (E) seam and the Lower Kittanning (B) seam. Both seams were mined from the same shaft.

Water from the Cresson No.9 E Seam mine pool discharges from a mineshaft that drains into an unnamed tributary of Clearfield Creek, locally known as Trapp Run. This mine discharge was named CR-01 in previous reports. The mine pool in the Upper Freeport (E) seam covers approximately 570 acres and contains an estimated 360 million gallons of water. The Lower Kittanning (B) seam mine pool covers an area of approximately 700 acres and contains an estimated 530 million gallons of water. The Lower Kittanning (B) seam is approximately 200 feet deeper than the Upper Freeport (E) seam. Both seams were mined from the same shaft and the shaft has reportedly been backfilled with rock and gravel. Although there is no direct connection between the mine pools, intermingling of water from the B-Seam and E-Seam mine pools apparently occurs, based on the quality of the mine discharge at CR-01. The Cresson No.9 E-Seam mine pool water level was measured to be 1,924 feet above msl at borehole (SW2E). A second borehole (SW1B) was installed into the Lower Kittanning

(B) seam workings. The water elevation in the B seam borehole was measured to be 1,922 feet msl, at or nearly the same elevation as the above E seam mine pool.

The discharge from the Cresson No.9 E seam mine pool (CR-01) is at a surface elevation of approximately 1,923 feet. There are no direct discharges from the Cresson No.9 B seam mine pool. There appears to be an interconnection since both seams are near the same level and the water quality of the discharge resembles a mixture of the two individual seams (as sampled at other mine pools not intermixed). Flow measurements have been collected at these mines since 2007 by the PADEP. During this period, the mine discharge averaged 508 gpm.

#### Gallitzin Shaft Mine Pool

The Gallitzin Shaft Mine is located just northeast of the Town of Cresson and just west of Gallitzin Borough in Cambria County. The mine is located in the Upper Freeport (E) seam. Discharge from this pool occurs at two locations. The main discharge is at the caved mine entry adjacent to Bradley Run and the other one bubbles up as base flow downstream of the main discharge on Bradley Run. The discharge from the Gallitzin Shaft Mine, identified as CR-02 in previous reports, emerges from a caved entry adjacent to Bradley Run about 1 mile west of Gallitzin. The CR-02 mine discharge is at a surface elevation of 1,929 feet. The discharge rate from the Gallitzin Shaft mine averaged 760 gpm based on flows recorded since 2007. A monitoring well (CR-4) was installed by PADEP into the Gallitzin Shaft mine pool to measure the water level in the mine pool. The water level is at approximately 1,934 feet. The Gallitzin Shaft mine pool encompasses an area of approximately 220 acres and contains an estimated 180 million gallons of water.

Boring BH-3A was drilled into the Gallitzin Shaft mine pool during the previous phase of this project in 2012 to determine the coal elevation at this location and to monitor the mine pool water level. This boring is the site proposed for an extraction well (GSW2A) that will pump water from the Gallitzin Shaft mine pool. The surface elevation is 2,105 feet above msl at BH3A. The bottom of coal elevation of the Upper Freeport (E) Seam in the Gallitzin Shaft mine workings at this location is at an elevation of 1,810 feet above msl, and the mine pool water elevation based on a water level measurement on December 7, 2013, is 1,930 feet above msl.

#### Argyle Stone Bridge Mine Pool

The Argyle Stone Bridge Mine complexes are east of Cresson and southeast of Gallitzin, in Cambria and Blair Counties (southeast of both the Cresson No. 9 and Gallitzin Shaft Mines). The Argyle Stone Bridge Mine extracted coal from the Lower Kittanning (B) seam and covers about 2,140 acres. The discharge from the mine pool

(SR-01) is east of Tunnel Hill. Water emerges from a mine opening and flows into Sugar Run, a tributary to the Frankstown Branch of Juniata River. The Argyle Stone Bridge mine pool encompasses approximately 530 acres and contains an estimated 260 million gallons of water.

A monitoring well (SR-301) was installed previously and continues to be monitored by the PADEP. The elevation of the mine discharge (SR-01) is 2,061 feet above msl. The mine pool water level measured at the SR-301 monitoring well is approximately 2,061 feet above msl, which is approximately the same as the mine discharge elevation. Since 2007, when measurements began being collected, the mine has discharged at an average rate of 860 gpm.

This project also plans to place an extraction well and injection well on a small part of the Allegheny Portage Railroad Historic Site property. The Allegheny Portage Railroad Historic Site is a national park that is dedicated to the preservation of the history surrounding the first railroad to circumvent the Allegheny Mountains and the preservation of the natural resources associated with the area. The construction of the extraction well will include some access road improvements along with the development of approximately 0.34 acres of land, 1.14 acres in total (see figures 3,4, and 5). This EA addresses NPS resources related to the construction of this project.

General Environmental Assessment  
Cresson AMD Abatement Project

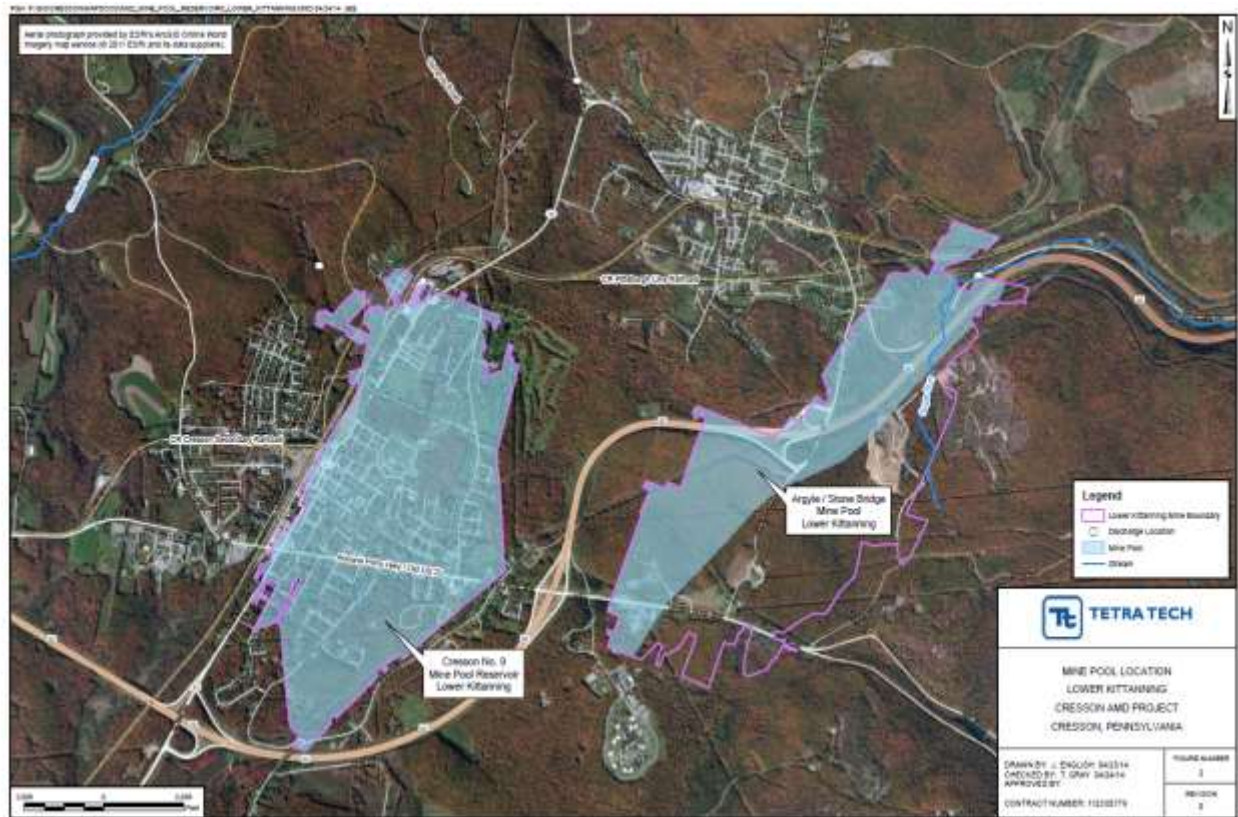
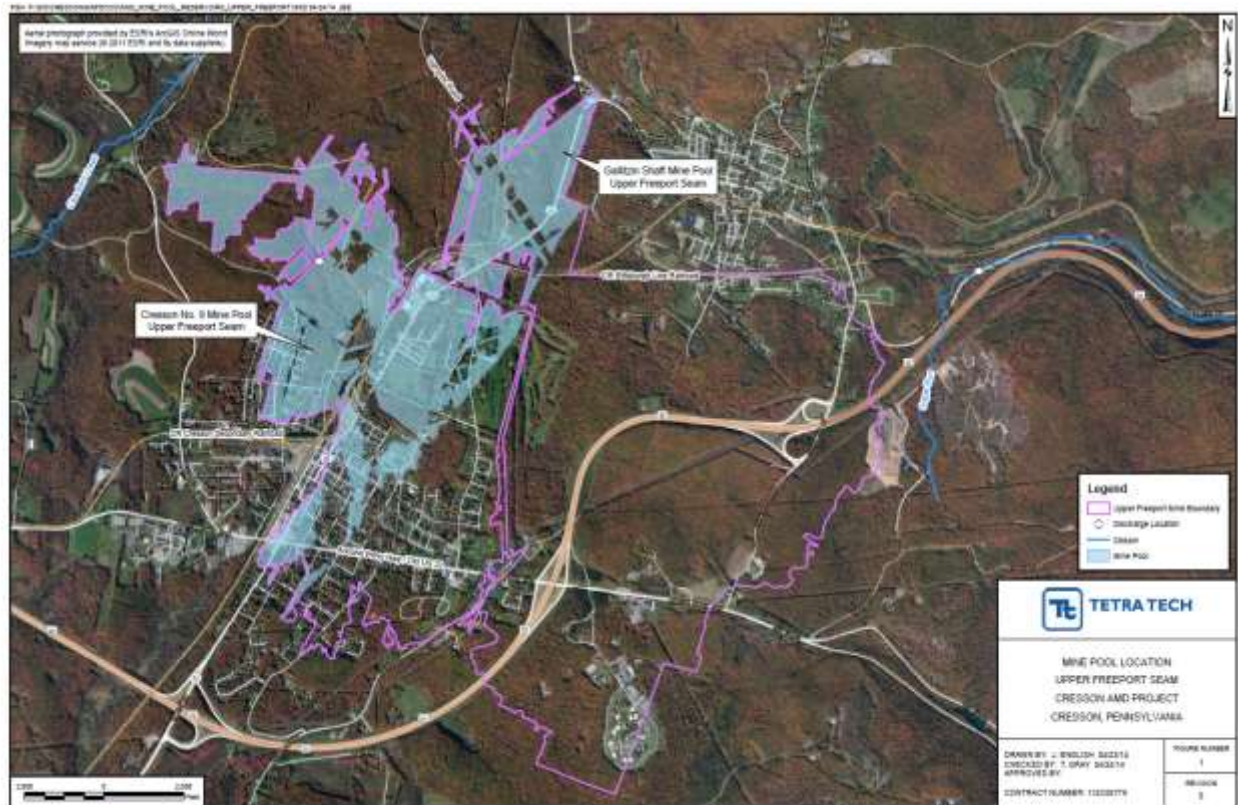


Figure 1. Lower Kittanning Mine Pools with associated discharge points.

General Environmental Assessment  
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# General Environmental Assessment Cresson AMD Abatement Project

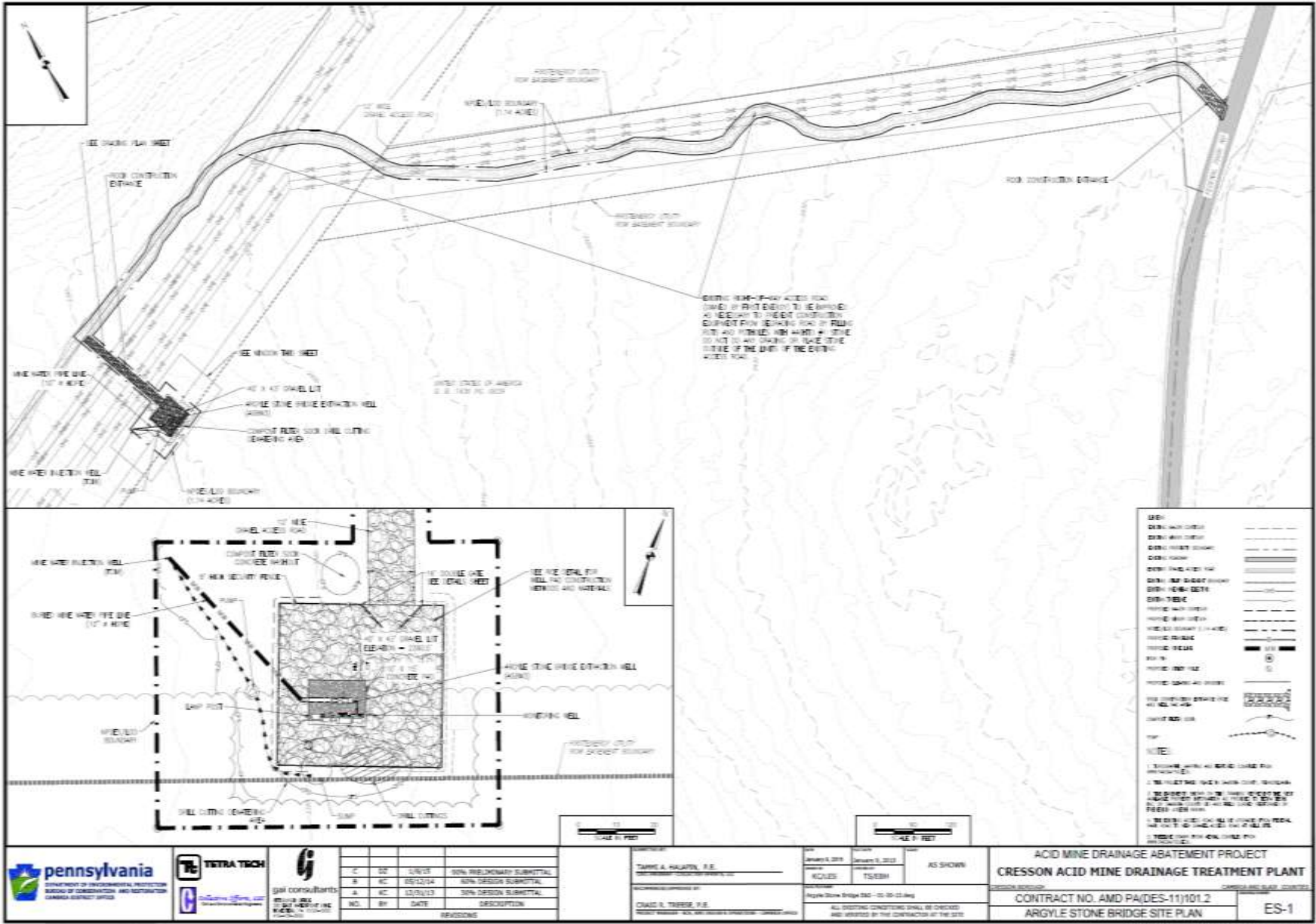


Figure 4. National Park Service site layout

General Environmental Assessment  
Cresson AMD Abatement Project

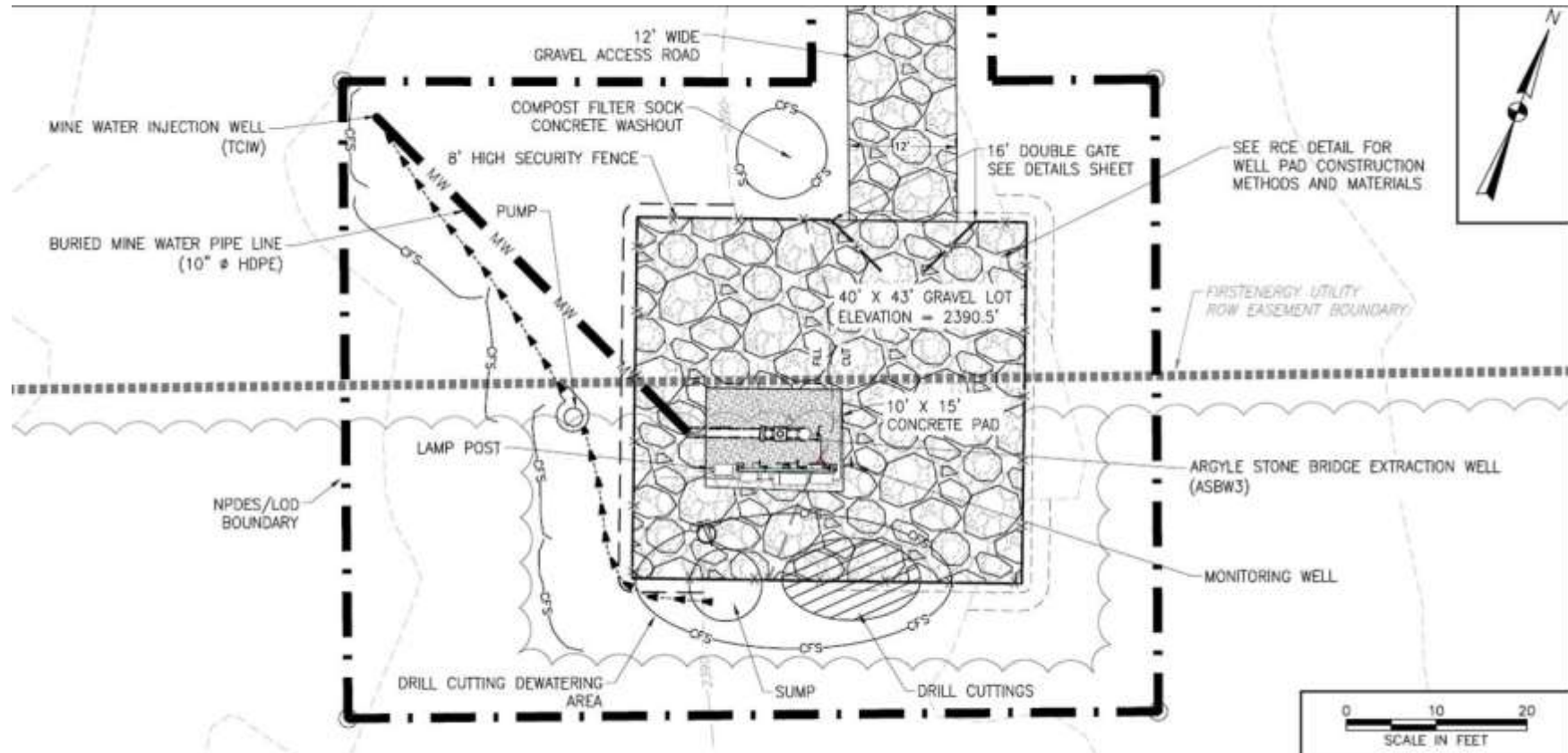


Figure 5. National Park Service site layout

## **B. NEED FOR THE PROPOSED ACTION**

### **1. Pennsylvania Department of Environmental Protection**

During active mine operations, groundwater which flowed into the mine workings was pumped out to the surface. Upon mine closure or abandonment, groundwater accumulated in the underground voids creating large mine pools. As more water flows into the mine pools, the water level rises until a natural or manmade opening allows this acidic water to escape into surface water resources. The mine influenced waters have a detrimental effect on plant and aquatic species. As a result, Clearfield Creek has been identified on the Commonwealth of Pennsylvania's Federal Clean Water Act Section 303(d) List of Waters as impaired by AMD. By drawing these mine pools down, the AMD water discharges will be stopped, allowing for the restoration of affected ecosystems.

Pollution from acid mine drainage (AMD) and low-flow conditions in the West Branch Susquehanna River have decreased river water quality to a point of concern for the Susquehanna River Basin Commission (SRBC). During the drier, hotter months, water levels in the West Branch Susquehanna River decrease and the demand for water use increases, resulting in an extremely low flow of poor quality river water. An agreement was reached between the SRBC and the Department of Environmental Protection (PADEP), to improve the West Branch Susquehanna River water quality and quantity by contributing up to 5.7 million gallons per day (MGD) of treated mine pool water to the river flow.

Three large discharges exist in the Cresson and Gallitzin areas, two of which flow into tributaries to Clearfield Creek and the other one flows into Sugar Run, a tributary to the Juniata River. The two discharges that flow into Clearfield Creek contribute on average a total of 115 lbs. of iron, 28 lbs. of aluminum, 5 lbs. of manganese, and 697 lbs. of acidity to the stream daily. The discharge that flows into Sugar Run contributes on average 27 lbs. of iron, 27 lbs. of aluminum, 5 lbs. of manganese, and 311 lbs. of acidity to the stream daily.

### **2. National Park Service**

The Argyle/ Stone Bridge Mine Pool underlies the Allegheny Portage Railroad National Historic Site. This mine pool is an integral part of PADEP's Cresson AMD Project. PADEP has submitted a permit to construct an extraction well on National Park Service property to extract the water from the Argyle/ Stone Bridge Mine Pool. The water from the mine pool will then be conveyed to the Cresson AMD Treatment Plant. The National Park Service needs to make a decision to either approve or deny the permit submitted

by PADEP that will address AMD issues associated with National Park Service property.

## C. ALTERNATIVES CONSIDERED

### Issues and Impact Topics

Impact topics are resources within the study area that could be affected, either beneficially or adversely, by the alternatives presented in this EA. Impact topics considered in this document were identified based on the issues raised during scoping, site conditions, federal laws, regulations, Executive Orders, NPS Management Policies 2006, Director's Orders, and staff knowledge of the park's resources. The impact topics carried forward for further analysis are listed below.

- Historic and Cultural Resources
- Water (Hydrology, Quality, and Quantity)
- Vegetation including wetlands
- Fish and wildlife resources
- Soils
- Geology and Geohazards
- Recreation
- Noise and Lighting
- Topography

A number of potential impact topics were initially considered but then dismissed from detailed analysis. These are described below with a short explanation on why they were dismissed.

- **Air quality.** Title 25 Pa Code §121.1 refers to Pennsylvania air basins. The project is not located in any special air quality zones regulated by state or local authorities and there are no issues with air quality associated with this project, therefore it has been dismissed from further analysis.

- **Archeological resources.** The federal legal mandates under which consideration of cultural resources most commonly takes place include Section 106 of the National Historic Preservation Act of 1966, Executive Order 11593, and the regulations of the Advisory Council on Historic Preservation (36 CFR 800). In Pennsylvania, state legal mandates include the Environmental Rights Amendment, Article 1, Section 27 of the Pennsylvania Constitution and the Pennsylvania History Code, 37 Pa. Cons. Stat. Section 500 et. seq. Briefly, these laws require that agencies meet their responsibilities by making a good faith effort to identify all significant cultural resources which may be affected by their actions, determining the National Register eligibility of those resources which may be affected, and considering ways to avoid or mitigate the effects of this action on National Register properties. A phase 1 archeological survey has been completed and nothing has been discovered, therefore it has been dismissed from further analysis.

- **Floodplains.** Executive Order 11988, “Floodplain Management,” requires federal agencies to “take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by flood plains” by, among other things, avoiding new developments within floodplains where practicable. This project is not located within a floodplain so it was dismissed from further analysis.

- **Environmental Justice** (Minority and low income population). Executive Order 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations”, requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental impacts of their programs and policies on minorities or low-income populations or communities as defined in the Environmental Protection Agency’s Revised Draft Guidance for Incorporating Environmental Justice Concerns in EPA’s NEPA Compliance Analyses (1997). This project does not affect any Environmental Justice areas, therefore it was dismissed from further analysis.

- **Energy resources.** Executive Order 2004-12 dealing with energy management and conservation illustrates the state of Pennsylvania’s and Pennsylvania’s Department of Environmental Protection’s commitment to conserve energy and where possible make improvements in energy efficiency and in the reduction of excess energy consumption. In all of the following alternatives; facilities, vehicles, and equipment will be operated and managed to minimize the consumption of energy, water and other non-renewable resources. Because of these commitments to energy conservation this resource topic has been dismissed from further analysis.

- **Topography.** This project will not involve any major earth disturbances that will affect the topography or relief of the project site therefore it has been dismissed from further analysis.

- **Public Health and Safety.** There will be no public interaction at the extraction wells and the treatment plant. Safety measures such as fences, gates, locks, signs, and cameras will be used to deter public interaction at these sites. All handling, storage and transfer of hazardous chemicals will comply with the Occupational Safety and Health Administration (OSHA) standard therefore it has been dismissed from further analysis.

- **Sacred Site.** Executive Order 13007, “Indian Sacred Sites”, requires managers of federal lands to avoid adversely affecting the physical integrity of Indian sacred sites. There are no Indian sacred sites as defined by E.O. 13007 within the project area, therefore it has been dismissed from further analysis.

-**Indian Trust Resources.** Secretarial Order 3175 requires that any anticipated impacts to Indian Trust Resources from a proposed project or action by agencies of the Department of the Interior be explicitly addressed in environmental documents. There are no known Indian Trust Resources at ALPO. No land within the park is held in trust

by the Secretary of the Interior for the benefit of Indians due to their status as Indians, therefore it has been dismissed from further analysis.

**-State and Federally listed threatened and endangered species and species of special concern.** A Pennsylvania Natural Diversity Inventory search was conducted and the Pennsylvania Game Commission, Pennsylvania Department of Conservation and Natural Resources, and the Pennsylvania Fish and Boat Commission determined there would be no known impacts to threatened or endangered species. However, the U.S. Fish and Wildlife Service determined further review would be necessary due to the Indiana Bat and the Northern Long-eared Bat. Also, the Pennsylvania Department of Conservation and Natural Resources identified the *Viola appalachiensis* (Appalachian Blue Violet) as a special concern species in the vicinity of the treatment plant. Mitigations for the Indiana Bat and the Northern Long-eared bat require no tree cutting between March 31<sup>st</sup> and November 16<sup>th</sup>. Mitigations for the Appalachian Blue Violet are to clean all construction vehicles to remove invasive plant seeds that may have been picked up from other sites. Upon further review the U.S. Fish and Wildlife service determined that no adverse impacts to the Indiana Bat or the Northern Long-eared Bat are likely to occur because of this project. Also, the Pennsylvania Department of Conservation and Natural Resources determined it is unlikely that this project will have any significant impact to the Appalachian Blue Violet; therefore this resource topic has been dismissed from further analysis.

#### **Alternative 1: Do not Construct Cresson AMD Treatment Plant**

Under this alternative, no environmental impacts or changes would occur due to this project. AMD would continue to discharge into Sugar Run and tributaries to Clearfield Creek. The selection of Alternative 1 is being presented and analyzed as though the construction of the treatment system would not occur and mine drainage would continue to adversely affect the water quality and biological resources of the headwaters of Clearfield Creek and Sugar Run.

#### **Alternative 2: Construct the Cresson AMD Treatment Plant without an extraction well on National Park Service property.**

The selection of alternative 2 is being presented as though the National Park Service (NPS) would deny the special use permit to construct an extraction well on NPS property. Alternative 2 would result in all of the same impacts as Alternative 3 except those associated with the NPS property. A new location for the Argyle/ Stone Bridge Mine Pool extraction well would need to be located and all associated impacts analyzed.

**Plant Construction & Operation:** The Pennsylvania Department of Environmental Protection, Bureau of Conservation and Restoration (PADEP-BCR) will operate the Cresson AMD Treatment Plant and will report 30-day average and peak flows of groundwater withdrawal from three mine pools: Argyle/Stone Bridge, Cresson 9

and Gallitzin Shaft for treatment of mine water, as well as the peak into-basin diversion to the West Branch Susquehanna River, Cresson Township, Cambria County, Pennsylvania to the Susquehanna River Basin Commission.

The proposed Acid Mine Drainage (AMD) Treatment Plant will consist of physical and chemical treatment of mine water using aeration, pH adjustment with lime slurry, chemical oxidation using hydrogen peroxide, solids settling and sludge disposal. The treatment facility will be located on property currently owned by Pristine Resources, Inc. on Cresson Shaft Road in Cresson Township. The proposed AMD treatment plant site is located on an existing coal refuse disposal site. The plant location is above the Cresson No.9 mine pool and approximately one mile from the Gallitzin Shaft mine pool. The treatment plant is designed for a feed rate of 4,400 gpm of raw water based on expected water quality of the three mine pools combined. Treated effluent will be discharged to a tributary of Clearfield Creek locally known as Trapp Run. The treatment process will be designed to meet effluent limits established in PA Code, Title 25, PADEP Chapter 87 subpart 102 - Hydrologic balance: effluent limits, Group A criteria, in addition to aluminum limits. Sludge generated by the treatment process will be pumped into underground mine workings of the Cresson No.9 Mine.

The components of the treatment plant will consist of:

- De-Carbonation Tank
- Reaction Tank
- Hydrogen Peroxide
- Lime Slurry Feed System
- Polymer Feed System
- Clarifier
- Polishing Pond
- Aerobic Wetland

**Mine Pool Management:** Three abandoned mine pools (Cresson No. 9, Gallitzin Shaft and Argyle/ Stone Bridge) will be managed as one project and treated at the proposed Cresson AMD treatment plant. The mine pools will be managed similar to most flood control dams. Upon start-up of the treatment plant and well pumps, the mine pools will be drawn down, at a rate that exceeds the current discharge, to a level so that no uncontrolled discharges will occur. The mine pools will be maintained as reservoirs so that the mine pools can be lowered by pumping when needed to supplement flow in Clearfield Creek and the West Branch Susquehanna River. The mine pools are expected to provide the treatment plant with up to 4,400 gpm of water when requested by the SRBC.

The plant will be operated continuously, but the pool elevations will be managed so that the pools are at their maximum elevation (but still low enough to prevent an untreated discharge) during times of the year when stream flow is low and the Susquehanna River Basin Commission (SRBC) may require an increased rate of treated water. If increased flow is needed, the plant and pumping/conveyance system have the capacity to provide up to 6.3 MGD (5.7 MGD required by the agreement with the SRBC, plus the 0.6 MGD base, minimum flow that would have discharged from the mine pools in low-flow conditions) for up to 100 days. At this point in time, the pools would be largely depleted and pumping and treatment would be scaled back significantly till the pools re-filled. If no water is called for by the SRBC in a given year, pumping would be maintained at a rate that would keep pool elevations at a stable level.

Should the proposed project be implemented, the current timeline would have the bid package out by July /August of 2015 with construction beginning in late 2015 or early 2016.

### **Sludge Disposal Activities:**

#### **Sludge Storage Capacity**

<b>Injection Well</b>	<b>Mine Pool</b>	<b>Approximate Pipe Length (ft)</b>	<b>Estimated Available Storage Volume (cubic ft)</b>	<b>Estimated Life (years)</b>
<b>SW1B</b>	<b>Cresson No. 9B</b>	<b>150</b>	<b>250,000 to 325,000</b>	<b>15 to 20</b>
<b>SW2E</b>	<b>Cresson No. 9E</b>	<b>50</b>	<b>250,000 to 325,000</b>	<b>15 to 20</b>
<b>SW3E</b>	<b>Cresson No. 9E</b>	<b>3,900</b>	<b>100,000 to 200,000</b>	<b>5 to 10</b>

The three proposed injection wells have sufficient capacity to meet plant needs for an estimated 35 to 50 years. Sludge storage calculations are based on 2 tons per day solids loading and sludge density of 80 pounds per cubic foot. The estimated storage volume is based on an assumed void factor of 50 percent of the total void space. This factor is uncertain and could vary significantly from the actual storage volume available because of the many unknown variables that could affect available sludge volume in underground mine workings. The Cresson No. 9 Mine workings in this area were mined out in the period from the early 1900s until the 1940s. Although roof conditions in main entries would have been more stable than sub-mains and room and pillar entries, roof caving could have occurred in main entries. The distance that sludge flows away from an injection well would be affected by mine characteristics, such as overburden rock characteristics, slope of the mine entries, and unknown obstructions. Sludge characteristics, such as sludge density, viscosity and percent solids would also affect

the distance that sludge could flow from the point of injection. Based on discussions with experienced AMD plant operators and mining engineers, including Larry Neff of Pristine Resources and John Foreman, an independent consultant familiar with the mine workings in the Cresson area, and the experience of Tetra Tech's project team, a 50 percent void factor is a reasonable estimate. Three injection well sites were identified to provide at least two alternate injection wells should the life of any one injection well be less than projected.

### **Routine Maintenance & Operation Activities:**

Anticipated O&M requirements, including day-to-day O&M, are anticipated to be the following:

- Inspect and fill oil reservoirs for each pumping unit.
- Lubricate/grease all bearing housings.
- Inspect all equipment for corrosion and repair as required.
- Inspect bulk chemical storage for clumping of material and clear blockages.
- Inspect and clean flashing mix tank of excess lime build up and deposits.
- Inspect basin liners for holes and observe underdrains for unusual water flow, repair liners as necessary.

There are additional factors that need to be considered in the operation of this plant, when taking into consideration staffing, resource and budgetary needs. Those factors are:

- The plant will have very few rotating parts. They will consist of centrifugal pump motors, dosing pump motors.
- Stability of stored chemicals
- Hydrated Lime - The chemical used for alkalinity will be hydrated lime, which will harden if it is subject to moisture. Special care during delivery and storage must be taken.
- Polymer - must be stored between 50 - 80 deg. F, and kept away from oxidizers. Shelf life is 240 days.

To improve the efficiency and control of the plant, instrumentation will be used in the process to measure and control various water qualities. Below is a list of parameters that may be monitored:

- Influent flow rate
- Influent pH
- Dissolved Oxygen after aeration
- pH prior to alkalinity addition (feed forward loop)
- pH after alkalinity addition (feedback loop)

- Effluent pH
- Effluent turbidity
- Effluent Dissolved Oxygen.
- Effluent flow rate
- Dissolved Oxygen after rough channel flow (if determined needed to increase dissolved oxygen levels)
- Dissolved oxygen at entry to stream

**AMD Conveyance System:** A mine pool routing plan for pumping mine water to the AMD treatment plant was developed during the previous phase of the project. Several different plans to transfer mine water to the AMD treatment plant location were evaluated. The locations of extraction wells, pipelines, and injection wells were chosen based on factors such as installing extraction wells at low mine elevations to maximize pool dewatering, locating the extraction wells in mine voids, property ownership, lower power needs, and total pipe length. The selected mine pool routing plan is summarized below.

Under this alternative, the location for the Argyle/ Stone Bridge extraction well and the subsequent Tunnel Hill Coaling Mine injection well is not identified. If this alternative is chosen, then a location would need to be identified and analyzed to determine the feasibility of the extraction well to manage the mine pool as needed. All of the environmental impacts associated with this location would have to be analyzed. No impact to NPS property would occur. Water would still be pumped from the Argyle Stone Bridge mine pool in the Lower Kittanning (B) seam and discharged into an injection well into the Tunnel Coaling Mine in the Upper Freeport (E) seam. Water injected into the Tunnel Coaling Mine is expected to flow by gravity through the abandoned mine workings into the Gallitzin Shaft mine pool.

Two extraction wells (GSW2A and GSW2B) will be constructed on property currently owned by Willard Wilkinson to withdraw water from the Gallitzin Shaft mine pool. A submersible turbine pump at each site will withdraw combined Gallitzin Shaft and Argyle Stone Bridge mine water. A 4,100 foot pipeline will be constructed from the GSW2A and GSW2B extraction wells to the proposed AMD treatment plant.

A well pump will be installed into the Cresson No.9 (E) seam mine workings, at a location along Plank Road near Sankertown, on property currently owned by Pristine Resources. The Cresson No.9 well (CR9W1) will pump water from the Cresson No.9 E-Seam mine workings through a pipeline approximately 3,600 feet long to the proposed AMD Treatment Plant.

**Waterline Extension:** The Cresson AMD Project could potentially impact the groundwater wells of residents located in the Vampire Road area and along State Route 53 of Gallitzin Township. These residents have wells into or just above the Gallitzin Shaft mine pool and may be affected by the pool drawdown. To mitigate this impact, PADEP-BCR plans to construct two waterlines, one from the Cresson Township Municipal Authority (CTMA) water distribution system to the residents and businesses along Vampire Road supplied by residential groundwater wells within the extent of the Gallitzin Shaft mine pool. The other one will extend from the end of the current public waterline in Gallitzin down along State Route 53. The Vampire Road waterline will be installed within the Gallitzin Township public right-of-way (ROW) for a distance of approximately 6,200 feet. The nearest connection to the CTMA public water distribution system is at a fire hydrant located alongside Cresson Shaft Road in the Village of Cresson Shaft. Starting at the fire hydrant, the proposed waterline will continue east on Cresson Shaft Road, turn north on Vampire Road and end at the last residence on the north end of Vampire Road. In addition to the main waterline, two sub-main waterlines will be installed to supply homes on Meadowbrook Lane and Cherry Lane.

The waterline capacity will be based on the PADEP minimum capacities for a public water distribution system. At the maximum daily and peak hourly demand, a minimum pressure of 20 psig will be maintained at all points in the system. The proposed waterline will supply residential homes and a medical outpatient treatment facility. Based on discussions with the office manager of Mainline Medical Associates, the medical facility has approximately 50 employees and treats an estimated 250 to 300 patients per day. The office has two buildings and two water wells that are approximately 300 feet deep and separated by a distance of approximately 300 feet. The main building is approximately 10,000 square feet with 18 exam rooms, five 1.7-gallon toilets, one shower, and 25 sinks. The septic system is designed for a maximum flow rate of 1,400 gpd, 5.5 days per week. The well of the main building has a pumping capacity of approximately 4 gpm. The other building is approximately 4,000 square feet, with a well that pumps at 3.5 gpm and has a septic system sand mound designed for a maximum 600 gpd. The estimated average daily flow rate for the medical facility is 1,500 gpd. Future capacity for eight additional homes will be provided based on available land and lot sizes.

### **Special Design Features for Mitigation**

There is potential that private water wells along Vampire Road and State Route 53 in Gallitzin Township could be affected by the lowering of the mine pools. With this in mind, a water line extension plan was developed to extend the public water line that ends in Sankertown, part of Cresson Township, out along Vampire Road to supplement any water quality and quantity issues that may occur. There is the potential that some

additional wells may be impacted along State Route 53 in Gallitzin Township. There is a plan to extend the public water line from Gallitzin Township to replace the wells that may be affected.

The pumps and motors associated with the extraction wells may contribute to noise that could affect people and wildlife in the surrounding areas. With this in mind, it was decided to place the pumps and motors of the extraction wells underground to eliminate any excess noise they may create.

**Alternative 3: Construct the Cresson AMD Treatment Plant with an extraction well on National Park Service property (Preferred Alternative).**

Under this alternative, the Cresson AMD treatment plant would be constructed and begin treating AMD from three different mine pools: the Argyle Stone Bridge Mine Pool which underlies National Park Service (NPS) property, the Cresson No.9 Mine Pool which underlies Cresson, and the Gallitzin Shaft Mine Pool which underlies Gallitzin, Pennsylvania. The mine pools would be treated like reservoirs to supplement flow to the Susquehanna River during periods of low flow. The mine pools would be drawn down initially to eliminate the three discharges originating from the underground mine complexes. They would then be maintained at a certain elevation within the mines. Water would be extracted from the mines and pumped to the treatment plant location which is planned to be located on an old Bureau of Abandoned Mine Reclamation project site in Sankertown, Pennsylvania. Following treatment using hydrated lime and hydrogen peroxide, the mine water would be discharged into Trapp Run, a tributary of Clearfield Creek.

**Plant Construction & Operation:** The proposed Acid Mine Drainage (AMD) Treatment Plant will consist of physical and chemical treatment of mine water using aeration, pH adjustment with lime slurry, chemical oxidation using hydrogen peroxide, solids settling and sludge disposal. The treatment facility will be located on property currently owned by Pristine Resources, Inc. on Cresson Shaft Road in Cresson Township. The proposed AMD treatment plant site is located on an existing coal refuse disposal site. The plant location is above the Cresson No.9 mine pool and approximately one mile from the Gallitzin Shaft mine pool. The treatment plant is designed for a feed rate of 4,400 gpm of raw water based on expected water quality of the three mine pools combined. Treated effluent will be discharged to a tributary of Clearfield Creek locally known as Trapp Run. The treatment process will be designed to meet effluent limits established in PA Code, Title 25, PADEP Chapter 87 subpart 102 - Hydrologic balance: effluent limits, Group A criteria, in addition to aluminum limits. Sludge generated by the treatment process will be pumped into underground mine workings of the Cresson No.9 Mine.

The components of the treatment plant will consist of:

- De-Carbonation Tank
- Reaction Tank
- Hydrogen Peroxide
- Lime Slurry Feed System
- Polymer Feed System
- Clarifier
- Polishing Pond
- Aerobic Wetland

**Mine Pool Management:** The Pennsylvania Department of Environmental Protection, Bureau of Conservation and Restoration (PADEP-BCR) will operate the Cresson AMD Treatment Plant and will report 30-day average and peak flows of groundwater withdrawal from three mine pools: Argyle/Stone Bridge Mine Pool, Cresson No. 9 Mine Pool and Gallitzin Shaft Mine Pool for treatment of mine water, as well as the peak into-basin diversion to the West Branch Susquehanna River, Cresson Township, Cambria County, Pennsylvania to the Susquehanna River Basin Commission.

Three abandoned mine pools (Cresson No. 9, Gallitzin Shaft and Argyle Stone Bridge) will be managed as one project and treated at the proposed Cresson AMD treatment plant. The mine pools will be managed similar to most flood control dams. Upon start-up of the treatment plant and well pumps, the mine pools will be drawn down to a level so that no uncontrolled discharges will occur. The mine pools will be maintained as reservoirs so that the mine pools can be lowered by pumping when needed to supplement flow in Clearfield Creek and the West Branch Susquehanna River. The mine pools are expected to provide the treatment plant with up to 4,400 gpm of water when requested by the SRBC.

The plant will be operated continuously, but the pool elevations will be managed so that the pools are at their maximum elevation (but still low enough to prevent an untreated discharge) during times of the year when stream flow is low and the Susquehanna River Basin Commission (SRBC) may require an increased rate of treated water. If increased flow is needed, the plant and pumping/conveyance system have the capacity to provide up to 6.3 MGD (5.7 MGD required by the agreement with the SRBC, plus the 0.6 MGD base, minimum flow that would have discharged from the mine pools in low-flow conditions) for up to 100 days. At this point in time, the pools would be largely depleted and pumping and treatment would be scaled back significantly till the pools re-filled. If

no water is called for by the SRBC in a given year, pumping would be maintained at a rate that would keep pool elevations at a stable level.

Should the proposed project be implemented, the current timeline would have the bid package out by July /August of 2015 with construction beginning in late 2015 or early 2016.

### **Sludge Disposal Activities:**

#### **Sludge Storage Capacity**

<b>Injection Well</b>	<b>Mine Pool</b>	<b>Approximate Pipe Length (ft)</b>	<b>Estimated Available Storage Volume (cubic ft)</b>	<b>Estimated Life (years)</b>
<b>SW1B</b>	<b>Cresson No. 9B</b>	<b>150</b>	<b>250,000 to 325,000</b>	<b>15 to 20</b>
<b>SW2E</b>	<b>Cresson No. 9E</b>	<b>50</b>	<b>250,000 to 325,000</b>	<b>15 to 20</b>
<b>SW3E</b>	<b>Cresson No. 9E</b>	<b>3,900</b>	<b>100,000 to 200,000</b>	<b>5 to 10</b>

The three proposed injection wells have sufficient capacity to meet plant needs for an estimated 35 to 50 years. Sludge storage calculations are based on 2 tons per day solids loading and sludge density of 80 pounds per cubic foot. The estimated storage volume is based on an assumed void factor of 50 percent of the total void space. This factor is uncertain and could vary significantly from the actual storage volume available because of the many unknown variables that could affect available sludge volume in underground mine workings. The Cresson No. 9 Mine workings in this area were mined out in the period from the 1900s until the 1940s. Although roof conditions in main entries would have been more stable than sub-mains and room and pillar entries, roof caving could have occurred in main entries. The distance that sludge flows away from an injection well would be affected by mine characteristics, such as overburden rock characteristics, slope of the mine entries, and unknown obstructions. Sludge characteristics, such as sludge density, viscosity and percent solids would also affect the distance that sludge could flow from the point of injection. Based on discussions with experienced AMD plant operators and mining engineers, including Larry Neff of Pristine Resources and John Foreman, an independent consultant familiar with the mine workings in the Cresson area, and the experience of Tetra Tech's project team, a 50 percent void factor is a reasonable estimate. Three injection well sites were identified to provide at least two alternate injection wells should the life of any one injection well be less than projected.

### **Routine Maintenance & Operation Activities:**

Anticipated O&M requirements, including day-to-day O&M, are anticipated to be the following:

- Inspect and fill oil reservoirs for each pumping unit.
- Lubricate/grease all bearing housings.
- Inspect all equipment for corrosion and repair as required.
- Inspect bulk chemical storage for clumping of material and clear blockages.
- Inspect and clean flashing mix tank of excess lime build up and deposits.
- Inspect basin liners for holes and observe underdrains for unusual water flow, repair liners as necessary.

There are additional factors that need to be considered in the operation of this plant, when taking into consideration staffing, resource and budgetary needs. Those factors are:

- The plant will have very few rotating parts. They will consist of centrifugal pump motors, dosing pump motors.
- Stability of stored chemicals
- Hydrated Lime - The chemical used for alkalinity will be hydrated lime, which will harden if it is subject to moisture. Special care during delivery and storage must be taken.
- Polymer - must be stored between 50 - 80 deg. F, and kept away from oxidizers. Shelf life is 240 days.

To improve the efficiency and control of the plant, instrumentation will be used in the process to measure and control various water qualities. Below is a list of parameters that may be monitored:

- Influent flow rate
- Influent pH
- Dissolved Oxygen after aeration
- pH prior to alkalinity addition (feed forward loop)
- pH after alkalinity addition (feedback loop)
- Effluent pH
- Effluent turbidity
- Effluent Dissolved Oxygen.
- Effluent flow rate
- Dissolved Oxygen after rough channel flow (if determined needed to increase dissolved oxygen levels)
- Dissolved oxygen at entry to stream

**AMD Conveyance System:** A mine pool routing plan for pumping mine water to the AMD treatment plant was developed during the previous phase of the project. Several different plans to transfer mine water to the AMD treatment plant location were evaluated. The locations of extraction wells, pipelines, and injection wells were chosen based on factors such as installing extraction wells at low mine elevations to maximize pool dewatering, locating the extraction wells in mine voids, property ownership, lower power needs, and total pipe length. The selected mine pool routing plan is summarized below.

Water will be pumped from the Argyle Stone Bridge mine pool in the Lower Kittanning (B) seam and discharged into an injection well into the Tunnel Coaling Mine in the Upper Freeport (E) seam. The injection well into the Tunnel Coaling Mine (TCIW) will be located approximately 70 feet from the Argyle Stone Bridge extraction well (ASBW3). Extraction well ASBW3 and injection well TCIW would be located on property owned by the United States Government under management of the National Park Service. The Tunnel Coaling injection well is located up dip of the Gallitzin Shaft and Cresson Mines. Water injected into the Tunnel Coaling Mine is expected to flow by gravity through the abandoned mine workings into the Gallitzin Shaft mine pool.

Two extraction wells (GSW2A and GSW2B) will be constructed on property currently owned by Willard Wilkinson to withdraw water from the Gallitzin Shaft mine pool. A submersible turbine pump at each site will withdraw combined Gallitzin Shaft and Argyle Stone Bridge mine water. A 4,100 foot pipeline will be constructed from the GSW2A and GSW2B extraction wells to the proposed AMD treatment plant.

A well pump will be installed into the Cresson No.9 (E) seam mine workings, at a location along Plank Road near Sankertown, on property currently owned by Pristine Resources. The Cresson No.9 well (CR9W1) will pump water from the Cresson No.9 E-Seam mine workings through a pipeline approximately 3,600 feet long to the proposed AMD Treatment Plant.

**Waterline Extension:** The Cresson AMD Project could potentially impact the groundwater wells of residents located in the Vampire Road area and along State Route 53 of Gallitzin Township. These residents have wells into or just above the Gallitzin Shaft mine pool and may be affected by the pool drawdown. To mitigate this impact, PADEP-BCR plans to construct two waterlines, one from the Cresson Township Municipal Authority (CTMA) water distribution system to the residents and businesses along Vampire Road supplied by residential groundwater wells within the extent of the Gallitzin Shaft mine pool. The other one will extend from the end of the current public waterline in Gallitzin down along State Route 53. The Vampire Road waterline will be installed within the Gallitzin Township public right-of-way (ROW) for a distance of

approximately 6,200 feet. The nearest connection to the CTMA public water distribution system is at a fire hydrant located alongside Cresson Shaft Road in the Village of Cresson Shaft. Starting at the fire hydrant, the proposed waterline will continue east on Cresson Shaft Road, turn north on Vampire Road and end at the last residence on the north end of Vampire Road. In addition to the main waterline, two sub-main waterlines will be installed to supply homes on Meadowbrook Lane and Cherry Lane.

The waterline capacity will be based on the PADEP minimum capacities for a public water distribution system. At the maximum daily and peak hourly demand, a minimum pressure of 20 psig will be maintained at all points in the system. The proposed waterline will supply residential homes and a medical outpatient treatment facility. Based on discussions with the office manager of Mainline Medical Associates, the medical facility has approximately 50 employees and treats an estimated 250 to 300 patients per day. The office has two buildings and two water wells that are approximately 300 feet deep and separated by a distance of approximately 300 feet. The main building is approximately 10,000 square feet with 18 exam rooms, five 1.7-gallon toilets, one shower, and 25 sinks. The septic system is designed for a maximum flow rate of 1,400 gpd, 5.5 days per week. The well of the main building has a pumping capacity of approximately 4 gpm. The other building is approximately 4,000 square feet, with a well that pumps at 3.5 gpm and has a septic system sand mound designed for a maximum 600 gpd. The estimated average daily flow rate for the medical facility is 1,500 gpd. Future capacity for eight additional homes will be provided based on available land and lot sizes.

### **Special Design Features for Mitigation**

There is potential that private water wells along Vampire Road and State Route 53 in Gallitzin Township could be affected by the lowering of the mine pools. With this in mind, a water line extension plan was developed to extend the public water line that ends in Sankertown, part of Cresson Township, out along Vampire Road to supplement any water quality and quantity issues that may occur. There is the potential that some additional wells may be impacted along State Route 53 in Gallitzin Township. There is a plan to extend the public water line from Gallitzin Township to replace the wells that may be affected.

The pumps and motors associated with the extraction wells may contribute to noise that could affect people and wildlife in the surrounding areas. With this in mind, it was decided to place the pumps and motors of the extraction wells underground to eliminate any excess noise they may create.

### **The Environmental Preferable Alternative**

“In accordance with the DO-12 Handbook, the NPS identifies the environmentally preferable alternative in its NEPA documents for public review and comment [Sect. 4.5 E(9)]. The environmentally preferable alternative is the alternative that causes the least damage to the biological and physical environment and best protects, preserves, and enhances historical, cultural, and natural resources. The environmentally preferable alternative is identified upon consideration and weighing by the Responsible Official of long-term environmental impacts against short-term impacts in evaluating what is the best protection of these resources. In some situations, such as when different alternatives impact different resources to different degrees, there may be more than one environmentally preferable alternative (43 CFR 46.30).”

Alternative 3 best protects and enhances the cultural and natural resources associated with this project. The elimination of 3 uncontrolled AMD discharges will help restore up to 21 miles of streams and provide clean, treated water to the West Branch Susquehanna River during low flow consumptive use. The site locations of all facilities associated with this project were chosen because they would provide the best means to control mine pool levels, allow the most efficient extraction and transfer of water from the mine pools to the treatment facility, and allow the most efficient and safest means to discharge clean water to the West Branch Susquehanna River. Based on the analysis of the environmental consequences of each alternative listed above, alternative 3 is the most environmental preferable alternative.

## **D. AFFECTED ENVIRONMENT**

To improve the discussions on existing environmental conditions, this assessment was structured to present information on the project in its entirety and specifically identifies resources associated with National Park Service property. Each resource value discussion below talks about the project in its entirety and then how it relates to National Park Service Property.

### **1. General Setting**

The project site is located in Cresson and Gallitzin Township, Cambria County. The location of the project can be found on the USGS Cresson 7.5 quadrangle in the vicinity of 40°28'23.70"N 78°35'03.93"W.

The Clearfield Creek watershed is one of the biggest watersheds within the West Branch Susquehanna River basin. It drains approximately 393 square miles of land and empties into the West Branch Susquehanna River just East of Clearfield Pennsylvania. Abandoned mines along the length of Clearfield Creek have severely degraded Clearfield Creek. While the project area covers both Gallitzin and Cresson townships, the treatment plant will be located in Cresson Township. See figure 6 below for the scope of the project.

Cresson Township has a total population of 4,336 people and Gallitzin Township has a total population of 1,324 according to the 2010 census.

Parts of this project will involve property owned by the National Park Service. The Allegheny Portage Railroad Historic Site is located in eastern Cambria County along U.S. State Route 22. This park's intention is to preserve the history of the first railroad to circumvent the Allegheny Mountains. The area of the park that will be affected by this project is located on the northern part of the park within a power line right of way.

The treatment plant project area is previously disturbed ground that lays just north of Cresson and east of Sankertown. Both communities are small rural communities that consist of private dwellings and small businesses with the occasional industrial business lot mixed in. There is light traffic throughout the day with periods of higher traffic occurring in the morning and afternoon as residents commute to and from work. These two communities lie alongside State Route 53. Trucks, both commercial and industrial, use State Route 53 to make local deliveries and to access communities in northern Cambria County. There is also significant rail traffic in the immediate area due to railroad tracks located across Cresson Shaft Road from the treatment plant site.

The treatment plant will use a suite of chemicals to raise pH, remove iron, and improve water quality. Those chemicals include a polymer flocculent and hydrogen peroxide to enhance iron precipitation, and hydrated lime to boost the pH of the water. Chemicals will be obtained from qualified suppliers and transported to the treatment plant in the appropriate vehicles. All chemicals will be maintained and stored at the site in secure locations and used in accordance with the treatment plant operational procedures.

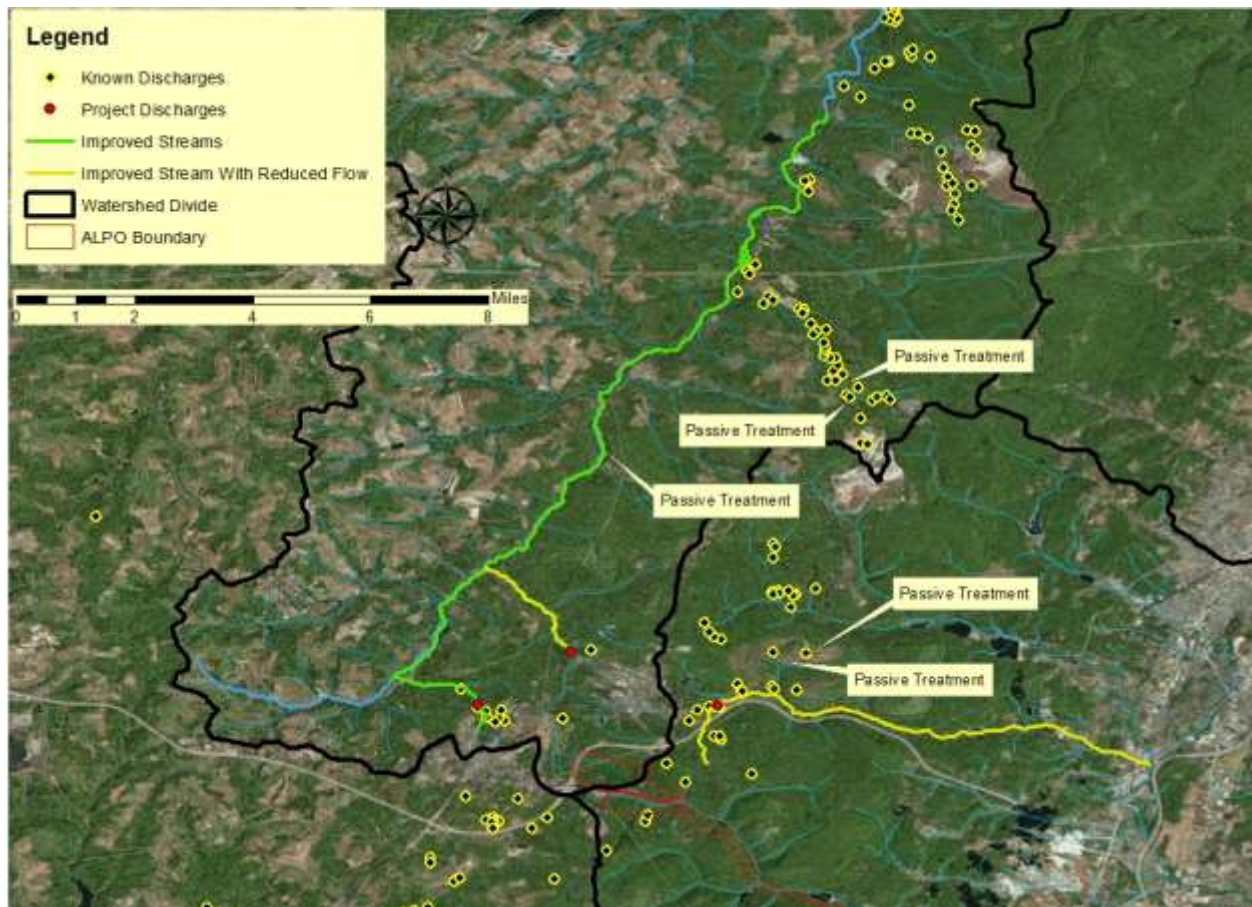


Figure 6. Project overview and affected areas

## 2. Other Affected Resources, Including Special Areas of Consideration

### RESOURCE VALUES

#### a. Historic & Cultural Resources

Most of the areas involved in this project have been previously disturbed. The treatment plant will be located on an old Bureau of Abandoned Mine Reclamation site that includes a coal refuse pile. The extraction well for the Gallitzin Shaft mine pool along with the water conveyance line leading to the treatment plant from the extraction well will be located on and along a power line right of way. Neither of these two locations holds any intrinsic historic or cultural resources. The extraction well for the Cresson No. 9 mine pool along with the water conveyance line from the well to the plant is the only part of this project that is not located on previously disturbed land. Even with the undisturbed nature of this site, it holds no intrinsic historic or cultural resource value.

##### a-1. National Park Service Historic & Cultural Resources

Allegheny Portage Railroad National Historic Site is in southwestern Pennsylvania in Blair and Cambria counties. The park protects the cultural resources that comprise the Allegheny Portage Railroad and tells the story of its influence on the nation. The park consists of two separate units extending across 40 miles. The main park unit is at the summit of the original portage, roughly 3 miles east of the town of Cresson. The main unit includes the Visitor Center, Lemon House, Incline 6 and Level 6, the Engine House 6 Ruins and Exhibit Shelter, and Skew Arch Bridge. The eastern slope portion of the main unit is long and narrow, reflecting the original footprint of the portage railroad. This portion contains Inclines and Levels 6–10. The park's Staple Bend Tunnel unit is approximately 16 miles southwest of the main unit and features the first railroad tunnel in the United States. With respect to the immediate project site located on NPS property, there are no identified historic or cultural resources.

#### **b. Water ( Hydrology, Quality, and Quantity)**

**Hydrology.** The Clearfield Creek watershed covers approximately 398 square miles in west central Pennsylvania. The headwaters of Clearfield Creek are located inside the northern border of Cambria County, a few miles southwest of Loretto, PA. The stream flows north-northeast from northern Cambria County into central Clearfield County, where it joins the West Branch Susquehanna River. Current hydrologic conditions and surface features of the treatment plant site include manmade channels designed to collect rain water and surface run off from the site and direct it towards Trapp Run. The site is flat with minimal grade and lacks thick lush vegetation so increased rain water infiltration occurs. This water comes into contact with coal refuse becoming slightly acidic and then discharges into Trapp Run.

Additionally, the Vampire Road area located above the Gallitzin Shaft mine pool has several homes with private water supply wells that extend into or close to the E seam void, also called the Upper Freeport Coal Seam. Most of the homes present on Vampire road maintain a private filtration system due to the degraded water quality of the aquifer from which their wells pull water.

**Water Quality.** The Clearfield Creek watershed is affected by pollution from abandoned mine drainage (AMD). The AMD has caused high levels of metals, (Fe, Al, Mn) and low pH in the main stem of Clearfield Creek upstream of Clearfield, PA. Total Maximum Daily Loads (TMDLs) were developed for impaired water bodies in the Clearfield Creek watershed by PADEP in 2007. The TMDLs prescribed waste load allocations (WLAs) for point sources and load allocations (LAs) for nonpoint sources for metals (Fe, Al, Mn) and acidity/alkalinity sources in the watershed to ensure the attainment of water quality endpoints (metals and pH). Sugar Run has been identified on the Commonwealth of Pennsylvania's Federal Clean Water Act Section 303(d) List

of Waters as impaired by AMD. Ninety-eight percent of Sugar Run's 6.62 miles of stream is listed as degraded. Of the 6,200 acre watershed, approximately 600 surface acres have been impacted by mining. A TMDL has been established for the Sugar Run watershed in the Beaverdam Branch Watershed TMDL report.

**Water Quantity.** Under the direction of the PADEP Bureau of Abandoned Mine Reclamation (BAMR), GAI Consultants Inc. completed the "Phase I SRB Low Flow Mine Storage and Treatment Project Evaluation" (Phase I SRB Report) in May 2007. This evaluation proposed a treatment plan for three AMD mine pool discharges (shown in figure 7 below) located in upper Clearfield Creek and an adjacent watershed, Sugar Run. The proposed AMD treatment facility would provide 5.7 MGD of water to Clearfield Creek to mitigate agricultural consumptive use during low-flow conditions and restore water quality in the main stem of Clearfield Creek.

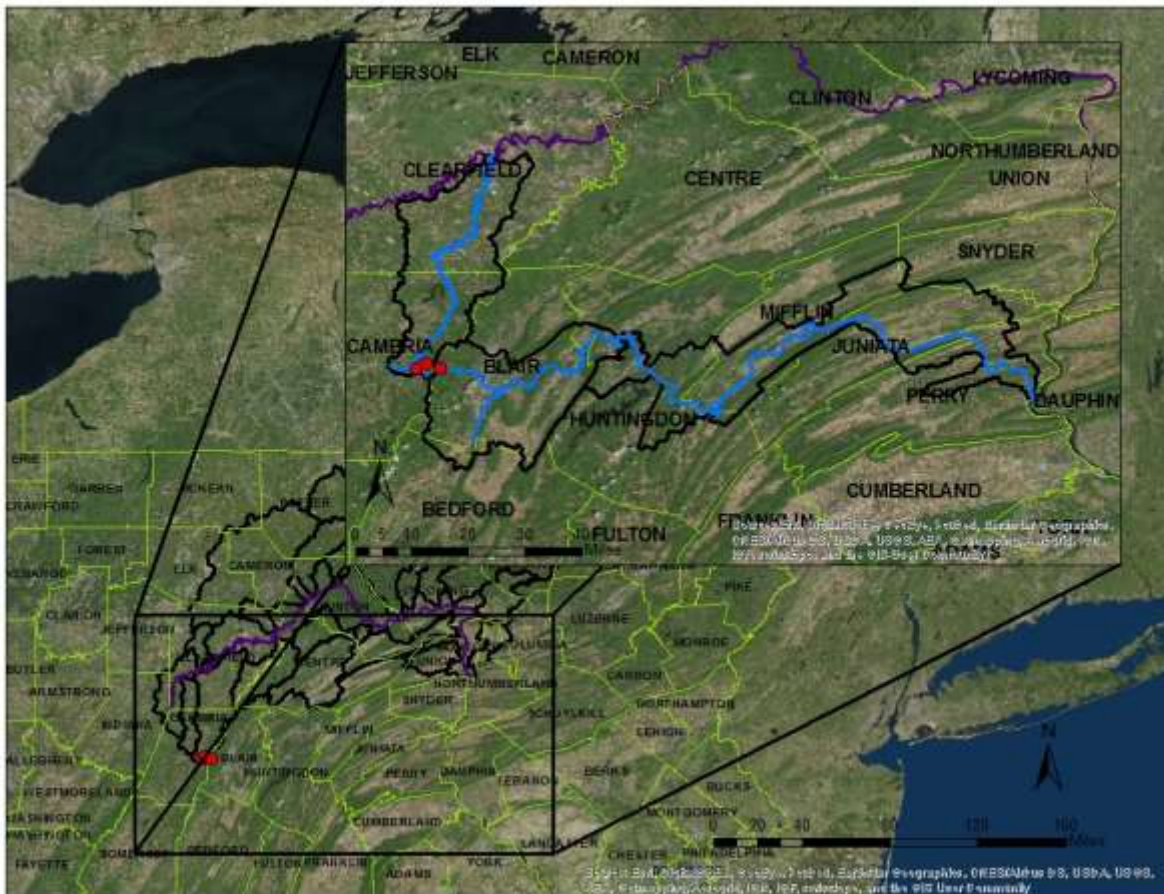


Figure 7. Discharge locations with respective watersheds.

### **b-1. National Park Service Water (Hydrology, Quality, and Quantity)**

**Hydrology.** There are no streams, ponds, lakes, or waterways located within the affected area of the project site. There are however, the headwaters of Bradley Run and a wetlands complex located approximately 2,000 feet down slope of the project. The project area will encompass 1.14 acres and is planned for placement of an extraction well and an injection well. There are two separate wetlands that are present, both of which are atypical, palustrine, emergent wetlands. The wetlands fall within a power line right of way located on National Park Service property and both appear to have been impacted by off-road vehicle activity along an existing dirt and gravel access road. These wetlands are fed by surface run-off, one perennial spring and five perennial ground water seeps. Both wetlands have a connection to an unnamed tributary of Bradley Run as determine by ALPO in 2014.

**Water Quality.** As indicated in “Field Report prepared 04-24-14 by Kathy Penrod, ALPO”, ALPO Wetland 7 and ALPO Wetland 6, located along the Penelec high-voltage power transmission line below the proposed PADEP mine water extraction site (well pump location), indicate no or very little influence of mine drainage and appear to be clean waters. The Argyle/ Stone bridge mine pool underlies portions of the park. The water in this mine pool discharges into Sugar Run. Water samples were collected from both the wetlands and their tributaries along with the mine pool discharge and analyzed. According to the aforementioned field report, the preliminary conclusion would indicate there is no connection between the Argyle/ Stone Bridge mine pool and ALPO resources.

**Water Quantity.** As mentioned above, there are no streams, lakes, or waterways, located within the project site. The only water that has any direct connection to the project site would be from precipitation and surface run-off.

### **c. Vegetation**

The immediate project site will be located on an old Bureau of Abandoned Mine Reclamation project. The site consists of approximately 12 acres that are dominated by coal refuse with sparse vegetation. The sparse vegetation at this site consists of some ferns, grasses, and mosses with the occasional group of saplings. The two to three acres at the Southern end of the site are also previously disturbed by mining activities however; large trees dominate this area with shrubs and bushes comprising the undergrowth. The conveyance system that runs from the plant to the Gallitzin Shaft Mine will run along a power line that is well maintained and vegetation consists mostly of low lying vegetation such as ferns, grasses, wild flowers, and mosses. The conveyance system that runs from the Cresson 9 mine to the plant will run through

undisturbed forest which consists mostly of Maple, Oak, Cherry, and Birch trees with some Beech, Ash, and Hemlock trees mixed in. This site also has bushes and shrubs that lie along the affected area such as Witch Hazel, Mountain Laurel, and Rhododendron.

The conveyance pipelines will also cross through some wetland areas. The Cresson No. 9 conveyance system will run through approximately 0.08 acres of wetlands. The Gallitzin Shaft conveyance system will run through approximately 0.007 acres of wetlands. An additional wetland complex exists on Trapp Run downstream of the Cresson No. 9 discharge. This complex is partially being fed by the Cresson No. 9 discharge.

#### **c-1. National Park Service Vegetation**

The Allegheny Portage Railroad National Historic Site Natural Resource Condition Assessment conducted in 2013 was referenced in order to specifically identify the vegetation resources associated with NPS property. The following are resources associated with the park as per Natural Resource Report NPS/ALPO/NRR—2013/727.

Forests are considered ALPO's primary natural resource. About 100 acres of forested areas are characterized by a mixture of hemlock (*Tsuga canadensis*) and hardwood species, making up the balance of natural forest types within the park. The majority of forested areas are deciduous forest with more than one-half of the park characterized as Allegheny Hardwood Forest (52%) and an additional 17 % as Northern Hardwood Forest (Perles et al. 2007). These types are typical of higher elevations of the Allegheny Plateau and represent the most common forest types in the Summit Level section of the Main Unit. This area, along with locations north and west of the Hollidaysburg Reservoir, contains the highest quality examples of these forest types. These associations are dominated by sugar maple (*Acer saccharum*), yellow birch (*B. allegheniensis*), and black cherry (*Prunus serotina*). Important associate species include white oak (*Quercus alba*), red oak (*Quercus rubra*), sweet birch (*Betula lenta*), bitternut hickory (*Carya cordiformis*), shag-bark hickory (*Carya ovata*), American beech (*Fagus grandifolia*), and tuliptree (*Liriodendron tulipifera*) and red maple (*Acer rubrum*). Three types of Hemlock forests (Eastern Hemlock-Northern Hardwood, Eastern Hemlock-Tuliptree-Birch, and Dry Eastern Hemlock-Oak) are scattered throughout the park. Hemlocks are considered one of the park's prize components. The remaining natural areas are comprised of floodplain forest, alder shrubland, grassland and open meadow habitats associated with rivers, streams, and other smaller drainages. Interspersed with

these natural areas are conifer plantations, old fields and successional forests, the result of previous activities that removed the forested land cover. Most of the park's invasive species are found in these latter areas. Reed Canarygrass Riverine Grassland occurs along the Dry Run drainage near Foot of Ten and is dominated by the invasive *Phalaris arundinacea*. Forest types in the Staple Bend Tunnel Unit (SBTU) are generally of lower quality than those found near the Summit. The SBTU contains the highest abundance of Tuliptree- Beech-Maple Forest and the only patch of Alder-Riverine-Shrubland, as well as invasive stands of Japanese or Giant Knotweed Herbaceous Vegetation. Perles et al. (2007) provides extensive detail on habitat associations within ALPO, their extent and characteristic species. Grasslands occur largely within the park's cultural zones, primarily as a result of mowing to maintain the cultural viewshed and maintain the historic time period scene. These areas are mainly classified as 'medium-tall sod temperate or subpolar grassland' formation (National Vegetation Classification System), which is characterized by early-successional communities common in mowed fields and former pastures, orchards and agricultural areas. Common herbaceous species include orchard grass (*Dactylis glomerata*) and goldenrods (*Solidago* spp.). 25 Field studies at ALPO conducted by the Western Pennsylvania Conservancy (Grund and Bier 2000) documented one Pennsylvania Vulnerable plant species, ginseng (*Panax quinquefolia*) on park property, and one Pennsylvania Threatened plant species, American bugbane (*Cimicifuga americana*) close to and down slope of the park boundary. No federal or state endangered plant species have been identified within the park.

#### **d. Fish & Wildlife Resources**

Wildlife resources throughout the project area vary depending upon habitat setting. The area where the plant is to be constructed is an old Bureau of Abandoned Mine Reclamation site that still lacks thick lush vegetation. This area is traversed by deer, fox, raccoons, and other small mammals and reptiles. Most of the area that the project includes could probably be classified as early successional habitat. Early successional habitat can be very dynamic and productive with uniquely adapted animals. This type of habitat forms soon after a disturbance occurs in an area. Early successional plants usually consist of herbaceous annuals and perennials that quickly occupy disturbed areas. This type of habitat is unique in nature and provides refuge for small birds and feeding grounds for reptiles and mammals. 56 of the 60 most common mammal species found in the Northeastern United States use this type of habitat in some way. Wildlife resources in the areas of the proposed AMD discharge & conveyance and sludge disposal lines vary according to setting. Generally, the wooded sites, such as the area surrounding the Cresson No. 9 discharge support adequate habitat to provide food, cover, and reproduction for large mammals (deer, fox, raccoons, opossum, etc), small mammals (voles, moles, mice, shrews), songbirds (warblers, flycatchers, vireos,

etc) and, depending on stream water quality, some amphibians. The more open habitats associated with the waterline extension along Vampire Road and along State Route 53 and the conveyance line that comes from the Gallitzin Shaft pump site, which lies within a power line right of way, could be classified as early successional habitat. Finally, the poor water quality of the associated streams would tend to depress existing populations below the expected carrying capacity if good water resources were available.

#### **d-1. National Park Service Fish & Wildlife Resources**

The Allegheny Portage Railroad National Historic Site Natural Resource Condition Assessment conducted in 2013 was referenced in order to specifically identify fish and wildlife resources associated with NPS property. The following are resources associated with the park as per Natural Resource Report NPS/ALPO/NRR—2013/727.

A variety of wildlife can be found at ALPO. Species present or probably present in the park include 30 mammals, 120 birds, 15 fish, 19 amphibians and 12 reptiles. Mammals were surveyed at ALPO from March to October in 2004 and 2005 by Yahner and Ross (2006). Moist riparian areas provide habitat for several species of shrews including the masked shrew (*Sorex cinereus*) and the smoky shrew (*Sorex fumeus*). Upland areas provide habitat from species ranging from Eastern cottontail (*Sylvilagus floridanus*) to the gray fox (*Urocyon cinereoargenteus*). Pennsylvania is home to 11 species of bats, several of which are protected by state or federal agencies. The park provides potential habitat for one federally listed bat species that has not yet been found within the park, and at least one bat species of special concern has been identified within the park. The northern myotis (*Myotis septentrionalis*) is listed as a species of special concern. Bat populations in the northeastern US have declined dramatically in recent years due to White-nose Syndrome (WNS) (USFWS 2012). The bat community at Allegheny Portage Railroad NHS was surveyed in 1997, 2001, 2005-2006, and 2012. A survey of bat hibernacula by the Pennsylvania Game Commission completed in 1997 found four species of bats utilizing the Staple Bend Tunnel within the park (Yahner and Ross 2006). Acoustic and mist-netting surveys completed in 2005 and 2006 found that 6 of the 11 species found in Pennsylvania, occur within the park. The diversity in habitat such as forests, openings, water availability and its location within the broader landscape on the Allegheny Front likely contributed to the bat diversity (Gates and Johnson 2006). The avian community was surveyed at ALPO during the spring migration period and summer breeding season of 1997 (Yahner and Keller 2000). Avian community surveys were completed in the spring of 1997 to assess spring migration within the park. Yahner and Keller detected 61 species and 43 species at two different sites. Of the most commonly detected species in each site only two species overlapped, the Ovenbird and the American Redstart. During the summer breeding season, these sites were resurveyed and found 37 and 33 species respectively. There were five species in

common among the sites most common species detected, the Red-eyed Vireo, Ovenbird, Chipping Sparrow, Indigo Bunting and Song Sparrow. Yahner and Keller found that the most species detected within the park were long- and short-distant migrants, with fewest detections coming from resident species. When avian surveys were conducted two years later they found 113 species at ALPO. These surveys documented 39 new species previously unknown to the park. Additionally, annual surveys were conducted by the ERMN from 2007-2012 at three sites within the Park for the Louisiana Waterthrush (*Parkesia motacilla*) and “streamside” bird communities (Marshall et al. 2013). As a group, herptofauna have experienced extensive world-wide declines in population at a disproportionally high rate (Cushman 2006; Gibbons et al. 2000; Stuart et al. 2004). The inventory survey completed by Yahner and Ross in 2004-2005 found a wide variety of reptiles and amphibians 26 that require both aquatic and terrestrial habitats (Yahner and Ross 2006). For terrestrial salamanders, both redback (*Plithodon cinereus*) and northern slimy salamanders (*Plethodon glutinosus*) were found in abundance and northern two-lined salamanders (*Eurycea bislineata*) were the most abundant aquatic salamander found within the Park (Yahner and Ross 2006). ALPO also supports populations of the smooth green snake (*Liochlorophis vernalis*) and the Eastern box turtle (*Terrapene carolina*) both of which are listed as species of special concern in Pennsylvania by the Pennsylvania Fish and Boat Commission. Tzilkowski and Sheeder (2006) conducted a fish inventory of Blair Gap Run and its tributaries and found nine fish species typical of cool- and coldwater fish communities of the Susquehanna River drainage. No state or federally endangered species were captured and brown trout (*Salmo trutta*) was the only nonnative fish species encountered. The upper reaches of Blair Gap Run support a naturally reproducing native brook trout population, a species of special concern. Results from field surveys of brook trout (Tzilkowski and Sheeder 2006) suggested Blair Gap Run may meet the Class A wild trout water criteria. As of May 2015 Blair Run, a tributary to Blair Gap run is designated as wild trout waters by the Pennsylvania Fish and Boat Commission.

#### e. Soils

The soils likely to be encountered in the immediate vicinity of the treatment plant and along the conveyance lines were taken from the USDA Natural Resources Conservation Service Web Soil Survey accessed on June 25 2014. No soils designated as prime or unique farm land will be encountered.

At	Atkins silt loam, 0 to 3 percent slopes, frequently flooded
BeB	Berks channery silt loam, 3 to 8 percent slopes
BvB	Brinkerton very stony silt loam, 0 to 8 percent slopes
CaC	Cavode silt loam, 8 to 15 percent slopes
CeB	Cookport and Ernest soils, 3 to 8 percent slopes

CeC Cookport and Ernest soils, 8 to 15 percent slopes  
CvB Cookport and Ernest very stony soils, 0 to 8 percent slopes  
CvD Cookport and Ernest very stony soils, 8 to 25 percent slopes  
Du Dumps, mine  
HaC Hazleton channery loam, 8 to 15 percent slopes  
LDF Laidig soils, 25 to 70 percent slopes  
WaB Wharton silt loam, 3 to 8 percent slopes  
WaC Wharton silt loam, 8 to 15 percent slopes

#### **e-1. National Park Service Soils**

The soils likely to be encountered at the extraction well site and along the access road were taken from the USDA Natural Resources Conservation Service Web Soil Survey accessed on June 25 2014. No soils designated as prime or unique farmland will be encountered.

CvB Cookport and Ernest very stony soils, 0 to 8 percent slopes  
CvD Cookport and Ernest very stony soils, 8 to 25 percent slopes  
GnB Gilpin silt loam, 3 to 8 percent slopes  
HbB Hazleton channery sandy loam, 3 to 8 percent slopes, extremely stony  
WaC Wharton silt loam, 8 to 15 percent slopes

#### **f. Recreation**

The planned treatment plant location falls on an old coal refuse site that holds no substantial recreational use. Pipelines and conveyance systems however, pass through some undisturbed forest in which hunting and horseback riding has been observed. There are no recreational fisheries within the project area due to poor water quality of the surrounding waterways.

#### **f-1. National Park Service Recreation**

The Allegheny Portage Railroad Historic Site is characterized by recreation and education. The park is located in South West Pennsylvania approximately an hour East of Pittsburgh. The park receives a multitude of visitors each year that wish to experience the Pennsylvania wilds as well as the iconic history the park has to offer. The Allegheny Portage National Park features the Lemon House which was built in the 1830's and operated as a tavern to service the patrons of the railway and the northern turnpike. Also at the park, you can walk a network of trails winding through the Allegheny Mountains in which you can find a series of inclined planes that use to transit railcars up and down the mountain side on their way from Pittsburgh to Philadelphia.

The actual area of NPS property proposed to be impacted by the project is located along a power line right-of-way where off-road vehicles have trespassed on the property for recreational purposes. The NPS does not allow this use. There are no recreational activities supported by the NPS in the location of the project site.

#### **g. Geology and Geohazards**

The potential for impacts from mine subsidence exists within the project area because the mine pools underlie residential and commercial areas. In drought years the mine pool levels could fluctuate over a relatively large area. The useable storage area of Cresson No.9 Mine Pool covers approximately 650 acres. The Gallitzin Shaft useable mine pool area covers 260 acres and the Argyle/Stone Bridge useable mine pool area covers 500 acres. The potential for future mine subsidence was evaluated by GAI Consultants in the 2007 report. This analysis was reviewed during the project design phase and is still applicable. All of the mines associated with the three mine pools are room and pillar workings and coal production ended in the 1940's or 1950's. The Argyle/Stone Bridge mine complex workings are in the B Seam. The Gallitzin Shaft Mine and the Cresson No.9 mine workings are in the E Seam. The Cresson No.9 Mine also worked the B Seam although the extent of the mine workings could not be determined because no maps of the mine workings could be located. The subsidence evaluation includes an analysis of coal pillar strength for each of the mines based on the overburden depth and knowledge of the mine floor conditions. The Cresson No. 9 Mine B Seam mine workings were not evaluated since the lower mine pool would not be expected to impact potential subsidence. Site conditions are not conducive to the development of collapse structures, or sinkholes, at any of the sites. GAI conducted a study to evaluate the potential for subsidence (full report attached). This study identified 3 different categories for possible subsidence. Category 1, Green- Subsidence probably occurred during or soon after mining. Category 2, Yellow- Support area where subsidence is unlikely. Category 3, Red- Areas where subsidence may have occurred or may occur in the future. See figure 8 below for site specific subsidence category.

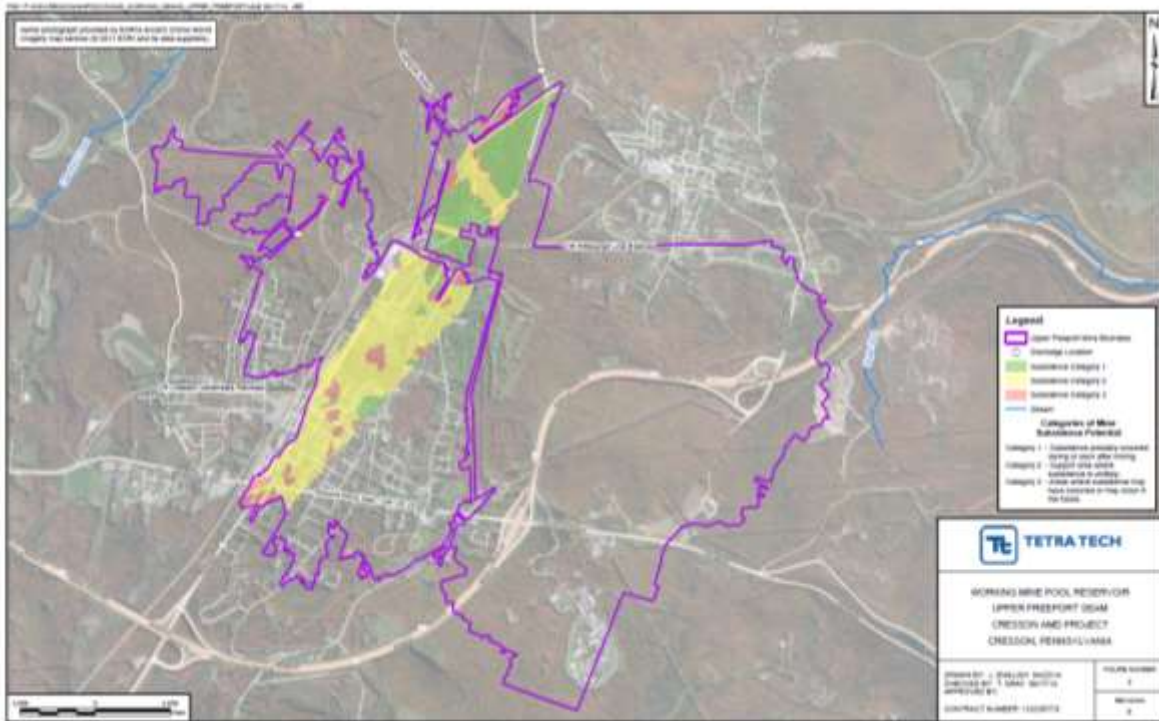


Figure 8. Subsidence areas

#### g-1. National Park Service Geology and Geohazards

The extraction well site that is planned for the NPS property overlies the Argyle/ Stone Bridge mine complex. The Argyle/Stone Bridge Mine is east of Cresson and southeast of Gallitzin, in Cambria and Blair Counties and southeast of both the Cresson No. 9 and Gallitzin Shaft Mines. The mine extracted coal from the Lower Kittanning seam and covers about 2140 acres. The Argyle/Stone Bridge mine pool covers approximately 800 acres extending down-dip toward Gallitzin and is located between 40 and 390 feet below the ground surface. At the northeast end of the mine pool the mine pool is less than 100 feet deep underlying Route 22, Sugar Run, Sugar Run Road, Tunnel Hill and the Norfolk and Southern Railroad. The mined area to the southwest beneath the National Park area ranges between 250 and 390 feet deep. The mine pool at this location is currently inundated by water. GAI conducted a study to evaluate the potential for subsidence (full report attached). This study identified 3 different categories for possible subsidence. Category 1, Green- Subsidence probably occurred during or soon after mining. Category 2, Yellow- Support area where subsidence is unlikely. Category 3, Red- Areas where subsidence may have occurred or may occur in the future. See figure 9 below for subsidence areas associated with NPS property.

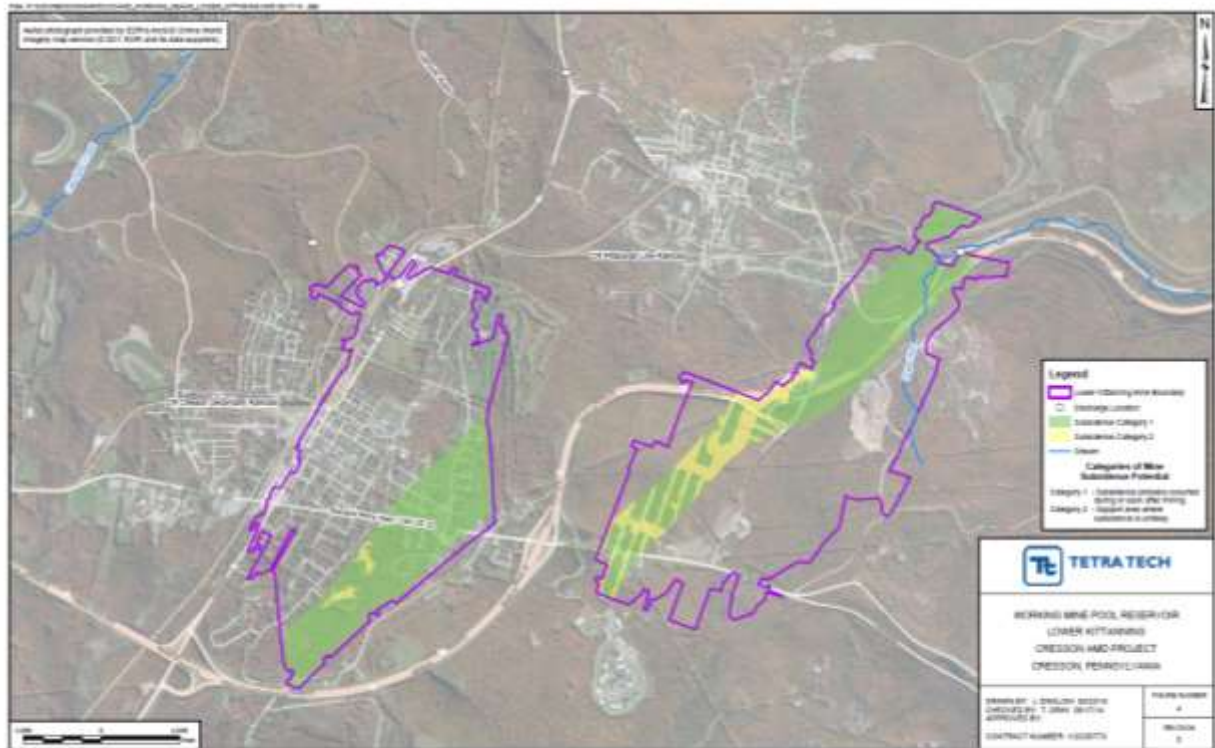


Figure 9. NPS subsidence areas

#### h. Noise and Lighting

The area of consideration is characterized by single family homes dispersed along Cresson Shaft Road, with the main concentrations at Sankertown and Cresson. Local shops and businesses are common with some heavy industrial property and traffic mixed in. This area is somewhat of a typical rural community with moderate ambient noise due to an active rail line that lies opposite of the project site.

Light pollution is defined as artificial skylight that interferes with astronomical observations. The area in which this project is planned to be constructed has light pollution levels 1 to 9 times that of the natural brightness levels for the area. According to a study conducted by P. Cinzano, F. Falchi, and C. D. Elvidge, The First World Atlas of the artificial night sky brightness, 99 percent of the population of the United States lives in areas where the night sky is above the threshold for polluted status. See figure 10 below for general light pollution across the united states.

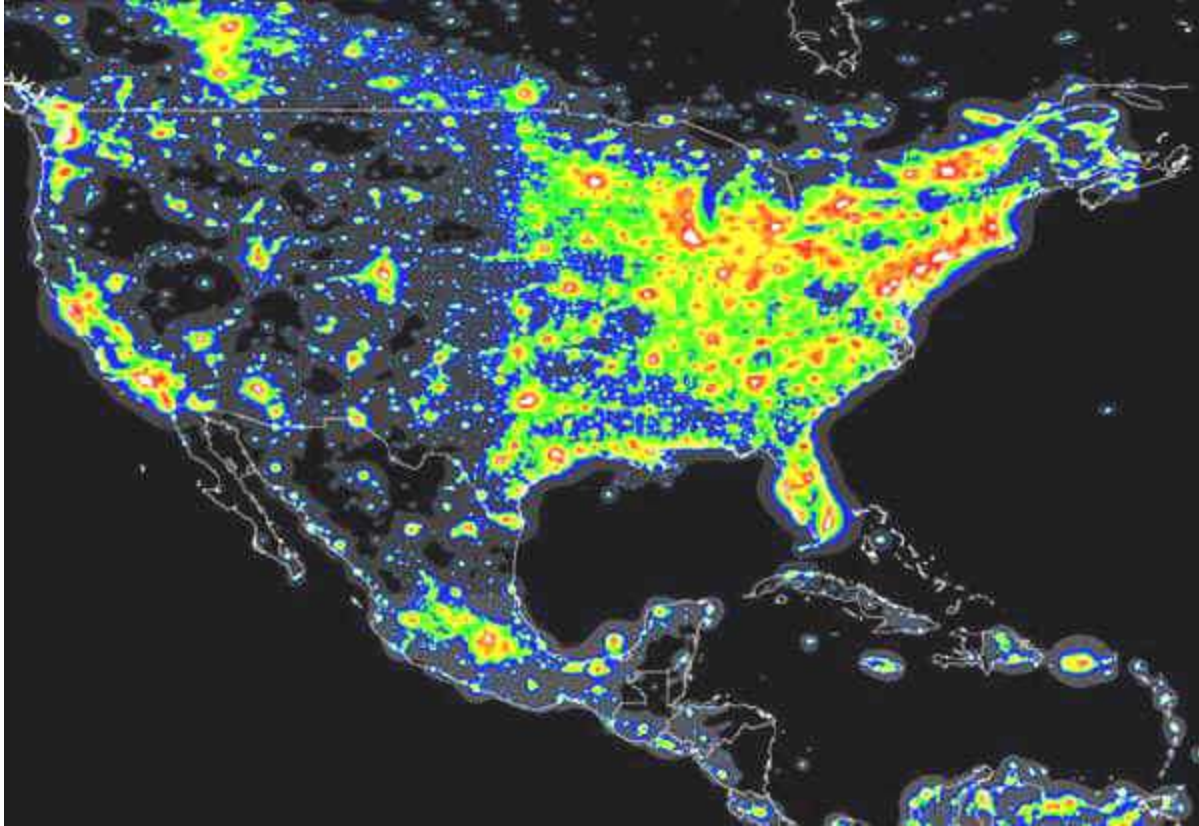


Figure 10. Taken from the Light Pollution and Technology Institute website, a map depicting the levels of light pollution in the United States.

#### **h-1. National Park Service Noise and Lighting**

The Visitor Center of the park is nestled back in the woods away from any substantial noise. However, the section of the park where the extraction well will be located lies on a power line right of way and lies adjacent to U.S. Route 22. There are sections in this area where there is direct line of site to U.S. Route 22. These areas have no trees or vegetation to act as a buffer to shield the noise that is generated by the passing motor vehicles on the highway.

Light pollution associated with the NPS is very similar to the rest of the project areas. Light from passing cars, nearby residential areas, and nearby industrial areas all contribute to light pollution affecting the ALPO site.

#### **i. Topography**

The project relief extends from an elevation of approximately 2,400 feet, where the extraction well will be located on National Park Service property, to 1,920 feet, where the injection well into the Cresson No.9 mine will be located just North of Sankertown.

The project area lies on the boundary of the Appalachian Front and the Pittsburgh Low Plateau sections of Pennsylvania. The project lies mostly on a previously disturbed hill side with some sections falling on forested hill sides and undisturbed land.

#### **i-1. National Park Service Topography**

The project site located on National Park Service property consists of an access road and a 40 foot by 40 foot gravel lot. The relief of this section extends from approximately 2,420 feet to 2,360 feet. This area is located south of Gallitzin and east of Cresson and falls within the Allegheny Front section of Pennsylvania.

### **E. ENVIRONMENTAL IMPACTS OF THE PROPOSED ALTERNATIVES**

#### **Alternative 1: Do not Construct Cresson AMD Treatment Plant**

This alternative will have no construction related positive or negative impacts on the resources or environmental components listed below. It should be noted that selection of Alternative 1 where the project is not developed will mean that the water quality of Clearfield Creek and Sugar Run will remain polluted and the environmental and social/community benefits discussed under Alternative 2 and 3 below will not occur.

#### **1. Resource Values**

- a) ***Historic and Cultural Resources***
- b) ***Water (hydrology, quality, and quantity)***
- c) ***Vegetation***
- d) ***Fish and Wildlife Resources***
- e) ***Soils***
- f) ***Recreational Resource Values***
- g) ***Geology and Geohazards***
- h) ***Noise***
- i) ***Topography***

Under this alternative, there would be no beneficial or negative impacts to the above resources associated with the construction and long term operation and maintenance of the Cresson AMD Treatment Plant.

#### **Alternative 2: Construct the Cresson AMD Treatment Plant without an extraction well on National Park Service property.**

This alternative will have all of the same impacts as alternative 3 except for impacts associated with the National Park Service. Under this alternative there will be no impacts to National Park Service property. However, this extraction well is an integral

part of this project. If it is not constructed on National Park Service property an alternative location will need to be identified to allow for the extraction of water from the Argyle/ Stone Bridge Mine Pool.

## **1. Resource Values**

### **a. Historic & Cultural Resources**

In a letter dated September 11, 2014, the Pennsylvania Historical and Museum Commission-Bureau for Historic Preservation (PHMC-BHP) requested that an archaeological survey be conducted on the Argyle Pump Station for the Cresson AMD Project in Cambria County, Pennsylvania. On October 23, 2014, GAI Consultants, Inc. conducted a Phase I a reconnaissance-level cultural resources investigation of the Argyle Pump Station. This reconnaissance was conducted to determine the probability for archaeological sites or historical and architectural resources to be present within the project area. The results of the reconnaissance survey revealed that the Argyle Pump Station contains significant disturbance and has a low probability to possess archaeological remains. These disturbances are a result from the construction of an existing gravel access road, overhead utilities, and a nearby wellhead. The disturbance was documented with digital photography and field notes. As a result of the disturbed project settings, no further cultural surveys are recommended at the Argyle Pump Station. These results will be summarized in a technical report that will be submitted to the PHMC-BHP, upon completion of the Phase I b survey for the overall Cresson AMD Project.

Approval of alternative one will have no impact on historic and cultural resources. Clearance was received from SHPO by letter dated July 21<sup>st</sup>, 2015.

### **b. Water (Hydrology, Quality, and Quantity)**

**Hydrology.** The hydrologic impacts to the treatment plant site will consist of re-grading a portion of the site and an increase of impervious cover to the site that will increase the amount of surface run-off. Man-made channels currently exist on site designed to direct surface run-off towards Trapp Run. Some of these channels will be removed and regraded. Encroachment of these channels will be covered under PA Code Ch. 105.12 (a) 16 restoration waiver. A storm water collection pond and a discharge channel will be constructed in order to handle the increased surface run-off. During construction of the treatment plant, erosion and sediment controls along with BMP's will be utilized to prevent excess sediment from leaving the site. The pipelines conveying the Gallitzin Shaft and the Cresson No. 9 mine waters will cross through some existing wetland areas. These wetlands will be affected during construction of the pipeline. During construction, the soil will be excavated and placed alongside the ditch. After the

pipeline is constructed, the soil that was removed will be placed back into the ditch so that the hydric soils may be preserved. This should have no more than a short term, moderate impact of the wetlands encountered. Long term operation and maintenance of the pipeline should have no more than a short term minor impact on the wetlands due to general maintenance, repair or replacement of the pipeline. These impacts will be covered under a PA Code Ch. 105 General Permit.

**Water Quality.** . Under alternative one, this project will have no more than a long term moderate, beneficial impact on Clearfield Creek and Sugar Run. As mentioned above Clearfield Creek and Sugar Run are impacted by acid mine drainage and are on the Commonwealth of Pennsylvania's Federal Clean Water Act Section 303(d) List of Waters as impaired by AMD. This project will protect and enhance the current fishery in the upper 15 miles of Clearfield Creek. The Cresson No. 9 and the Gallitzin Shaft mine discharge to tributaries of Clearfield Creek (Trapp Run and Bradley Run respectively). There have been fish kills reported in the Cresson Lakes during high flow due to the discharge from the Cresson No. 9 mine. Treatment of the Cresson No. 9 discharge would remove acidity and iron from Clearfield Creek. If treated in combination with the Gallitzin Shaft discharge, essentially all the acidity, iron and aluminum would be removed from the 4.2 miles of Clearfield Creek upstream of Amsbry, and fishing should recover in this segment, including the Cresson Lakes. The section from Amsbry to Brubaker Run, a distance of about 13 miles, should improve markedly from its present marginal condition. Additionally, a wetland complex exists on Trapp Run downstream of the Cresson No. 9 discharge. When the treatment plant comes online it will eliminate the Cresson No. 9 discharge, preventing it from flowing into Trapp Run. Subsequently, the Cresson No. 9 discharge will no longer pollute or provide any water to this wetlands complex. The Argyle/Stone Bridge discharge is by far the largest acid source affecting its receiving stream, Sugar Run. Treatment will remove about 65% of the acidity, 32% of the iron load and 73% of the aluminum load from Sugar Run between the discharge and the Altoona area. The current highly degraded condition of about five miles of Sugar Run should greatly improve. Tributaries immediately downstream of the mine discharge on Sugar Run should provide sufficient flow so that removal of the mine discharge should not significantly impair Sugar Run base flow. With the removal of this discharge, Bureau of Conservation and Restoration lower tier restoration goals should be achieved. Lower tier goals include biological restoration, including where applicable a recreational fishery and the following in stream contaminant concentrations must be met during normal stream flow conditions: pH > 6.0, alkalinity > acidity, total Fe < 1.5 mg/l, total Al < 0.5 mg/l, and TDS < 1,500 mg/l.

**Water Quantity.** There is a potential that lowering the mine pool will impact the operation of the water supply wells in this area. In anticipation that the water wells could be affected by the fluctuation of the water level in the Gallitzin Shaft Mine Pool, the cost of replacing the private water supplies by installing a pipeline from the nearest public water supply was developed. The Vampire Road properties are located in Gallitzin Township and the nearest public water supplies are the Gallitzin Water Authority and the Cresson Municipal Authority. Either of the two public water supplies could provide water to the Vampire Road area. Based on conversations with the Gallitzin Water Authority and the engineer for the Cresson Township Municipal Authority, both suppliers have sufficient capacity to supply Vampire Road. The Cresson Township Municipal Authority would have sufficient head to supply Vampire Road and less pipeline would be required because the connection point is closer. An additional waterline extension will be constructed to service some additional residents along State Route 53 that may be impacted by the lowering of this mine pool. This waterline will be continued from Gallitzin Township down to and along State Route 53.

The treatment plant will discharge into Trapp Run providing excess clean water to the wetland. With the excess water flowing into Trapp Run there will be a potential for scouring to take place. With this in mind, energy dissipating structures may need to be constructed within Trapp Run. With the Cresson No. 9 discharge being eliminated and additional clean water being supplied to the complex, there should be no more than a positive long-term minor impact on the wetland.

### **c. Vegetation**

Plant and conveyance line construction will involve clearing the site locations of vegetation. The Plant site consists of a previously disturbed area with sparse vegetation. The extraction well and conveyance line from the Gallitzin Shaft Mine falls within a well maintained power line right of way. The extraction well and conveyance line from the Cresson #9 mine falls on undisturbed forested land. Two of the sludge injection wells are located in the immediate vicinity of the plant and the third will be located on undisturbed forest land. The two conveyance pipelines will be reseeded with grasses and maintained in order to access the lines for routine maintenance. Routine maintenance may also include periodic refurbishing and replacement of sewer and sludge disposal conveyance lines. This may involve the excavation of existing line, repair or replacement, and backfilling of the excavated area and revegetation.

The waterline extension that will be built to service the residents of Vampire Road will be constructed within a previously disturbed area within the roadway corridor. This will consist of clearing the area of vegetation and digging a trench along the road for placement of the waterline.

Given that most of the project will be located on previously disturbed areas with either sparse or well-maintained vegetation, alternative one will have no more than a long term minor impact on vegetation.

#### **d. Fish & Wildlife Resources**

Construction of the treatment plant will permanently displace wildlife from the site. Given the nature of the site, with sparse vegetation, abandoned refuse, and poor soil quality renders this site with relatively little wildlife value. The construction of the extraction and injection wells, the conveyance lines, and waterline extensions will temporarily displace wildlife only during the construction phase of the project. During long term operation and routine maintenance of the extraction wells and conveyance lines, the habitat disturbed during construction will return. These activities will have a long term minor effect on fish and wildlife resources in the immediate project area.

As discussed under the project needs section, this project will markedly improve water quality in Clearfield Creek, Bradley Run, Trapp Run and, Sugar Run. With the addition of higher water quality and the elimination of the discharges; fish, macro invertebrates, and other aquatic organisms will return to these affected areas. This will establish a healthy supply of food for upper tier predators in turn increase and improve fish and wildlife habitat in and along the aforementioned streams. The long term operation of the treatment plant should have a long term, moderate impact on fish and wildlife resources in the project area. The Pennsylvania Natural Diversity Inventory (PNDI) search conducted indicated federal threatened or endangered species (Indiana Bat and Northern Long-eared Bat) exist on or near the project site. Through further review, The U.S. Fish and Wildlife Service determined that no adverse effects to these species are likely to occur. Clearance for the project was obtained from United States Fish and Wildlife Service, by letter, on 07/09/2015.

#### **e. Soils**

Given the disturbed nature of most of the sites involved in the construction of the treatment plant, it is unlikely that there will be any adverse effects to the soils in these areas. The treatment plant will be placed in an area that is dominated by coal refuse and previously disturbed soils. The permanent development of the site and the day to day operations of the plant will have no more than a long term negligible impact.

The pipelines that will be used to transport water from the extraction wells to the treatment plant will be placed in a ditch approximately four feet underground. The soil that is removed from the ditch will be used to fill it in after the construction of the pipeline. The sludge disposal line that runs from the plant down along Trapp Run will use the same route as the extraction well pipeline that comes from the Cresson No. 9 mine pool. This will limit any excess soil disturbance in the area. Routine operation and

maintenance of the pipelines may include accessing man holes along the pipeline to clear any obstructions that may occur within the pipeline or for just routine flushing of the pipelines. These activities will result in no more than a short term negligible impact.

The two waterline extensions that will service residents along Vampire Road and residents along State Route 53 will be constructed in the same fashion as the conveyance pipelines. The waterlines will be placed in a ditch approximately four feet deep and buried by the same soil removed from the ditch. The waterline extensions will be placed in previously disturbed soils within the Gallitzin Township public right of way. The waterlines will have hydrants and general access points placed along their lengths. Routine operation and maintenance would consist of flushing waterlines, general repairs and the occasional replacement of the waterlines themselves. During routine operation and maintenance of the waterlines there should be no further disturbance of the soils. Overall, the waterline extension will have no more than a short term negligible impact on the soils along Vampire Road and along State Route 53.

#### **f. Recreation**

The immediate plant site holds no significant recreational use; therefore the plant's construction and operation will have no impact on recreation. The construction of the conveyance system and the sludge injection lines run through undisturbed area where hunting and horseback riding has been observed. During construction these activities may be disrupted. Also, the conveyance lines will be running close to personal dwellings in which a variety of backyard and recreational activities may be taking place. The construction of the pipelines will have no more than a short term minor impact on these activities.

The plant's day to day operation will have some beneficial impacts on recreation. A total of about 21 miles of stream will be improved helping to restore a recreational fishery in the area. Parts of Clearfield Creek are on the current Pennsylvania Fish and Boat Commission's stocking schedule. This alternative should open up other areas in the headwaters of Clearfield Creek to be placed on the stocking schedule. This should be no more than a long term moderate impact on the watershed.

#### **g. Geology and Geohazards**

For the areas covered by the three mine pools, the overburden thickness is 40 or more times the mined height of coal. Therefore, subsidence, if it were to occur, would take the form of a subsidence trough, or a warping of the ground surface to form a saucer-shaped depression. Trough subsidence could occur wherever mine level support is lost due either to crushing of the coal pillars or to punching of the coal pillars into the mine floor. The potential for mine subsidence was estimated by GAI Consultants by calculating the factors of safety of the coal pillars. Based upon the review of the

available mine maps and data collected, it has been concluded that there is currently a low risk of subsidence above the mine pool areas that will be managed as reservoirs. Lowering the mine pools is not expected to induce mine subsidence at the sites. However, the potential for mine subsidence always exist in areas anytime underground mining has occurred. Therefore, it is recommended that all residents in these areas purchase mine subsidence insurance.

#### **h. Noise and Lighting**

Construction activities related to the treatment plant, AMD and sludge conveyance lines, the waterline extension, stream and road crossings and the development of access will generate short term noise impacts. The noise impacts will largely be confined to the treatment plant zone and along the conveyance lines as vegetation is removed, refuse is regraded, ponds are excavated, and construction traffic accesses the site for development of the plant.

The construction of the AMD conveyance, sludge conveyance lines, and development of AMD collection structures and the boreholes will result in short term elevated noise levels for the residences immediately adjacent to the construction area

The long term operation of the plant will not materially affect local noise levels. Plant related traffic and operation of the facility will result in occasional noise impacts. These are expected to be no more than long-term and minimal to the surrounding community, particularly due to the existing background noise from rail traffic in the area.

The treatment plant will utilize a lighting plan that will help insure a safe and efficient operation of the plant. At the plant its self, security lighting will be utilized to deter vandalism and trespassing of any unauthorized personnel unto the site. The security lighting will contribute to light pollution. The pump stations will all utilize a light plan that is dark sky compatible. In totality the lighting from this project should have no more than a long term minimal adverse impact on light pollution.

### **Impacts of Operation and Maintenance**

#### **2. Cumulative Impacts**

At this time there are seven other projects or jobs that have been identified and should be taken into consideration for having a cumulative impact on Clearfield Creek and Sugar Run during the life of this project. The seven projects or jobs consist of E.P. Bender Coal Company Inc. surface coal mine, two passive treatment sites with in the Sugar Run watershed, and four projects of the Clearfield Creek Watershed Association,

which are the Klondike Project, the West Ferris Wheel Project, the Brubaker Project, and the Amsbry Project.

**E.P. Bender Surface Mine.** This surface mine lies in the headwaters of Sugar Run. The surface mine permit was renewed on June 18, 2014 and was originally issued in 1992. This mine has multiple discharges that fall under Chapter 87, Subchapter F. Surface Coal Mine: Minimum requirements for remining areas with pollution discharges. Depending on flow and precipitation, these discharges could have an impact on Sugar Run.

**Two passive treatment sites.** There are two passive treatment systems that are in the Sugar Run watershed currently treating acid mine drainage from abandoned mine lands. Both of these sites were funded through the bond forfeiture appeals process. Site 26 consists of a vertical flow system composed of mushroom compost and limestone. Existing ponds were used with most of the alkalinity being generated through an anoxic limestone drain. Site 26-A consist of two vertical flow systems, two settling basins, and a final wetlands. This site was constructed using existing ponds with alkalinity being produced through a vertical flow system. Both of these systems discharge into a tributary of Sugar Run called Gumtree Run.

**Klondike Project.** Little Laurel Run is a tributary to Clearfield creek. Little Laurel Run is highly degraded by multiple discharges that originate from abandoned surface and underground mines that are located within its drainage basin. Little Laurel Run is a large contributor to the acid loading to Clearfield Creek. Approximately 1/3 of the pollution loading to Little Laurel Run originates from the abandoned Klondike Mine. Clearfield Creek Watershed Association applied for and was awarded a Growing Greener grant for the design and permitting of two passive treatment systems to treat the Klondike Mine discharges. They were also awarded a subsequent Growing Greener grant for the construction of these two systems. The two systems started treating water in November of 2007. These two systems are still functioning today. In June 2014 the systems had their compost and limestone refurbished.

**West Ferris Wheel Project.** The West Ferris Wheel site is located on Little Laurel Run about ¼ mile from the Klondike Site. It has two large discharges and one smaller one. The first large discharge flows at about 70 gal/min with a pH of 3.1, 14 mg/l of iron, and 117 mg/l of acidity. The second large discharge flows at about 90 gal/min with a pH of 3.3, 6.7 mg/l of iron, and 113 mg/l of acidity. In 2008 Clearfield Creek Watershed Association received a grant from the USEPA 319 funds for design and permitting of passive treatment systems to treat the discharges. The construction of the project is expected to start soon.

**Amsbry Project.** At the village of Amsbry, several AMD discharges flow into Clearfield Creek. There are five identified discharges in this area. Of these five, there are three sizable discharges that contribute the majority of the pollution in the Amsbry area. Clearfield Creek Watershed Association has already constructed two passive treatment systems with plans to construct another one to treat the third major discharge in the vicinity. They are planning to submit a Growing Greener grant in 2014 to fund this project.

**Brubaker Project.** Brubaker Run enters Clearfield Creek at Dean. Extensive clay and coal mining has taken place within the Brubaker Run drainage basin. Three abandoned clay mines are the major source of degradation in the watershed. Other smaller abandoned coal mine discharges exist as well. Currently, two of the clay mine discharges are being treated by E.P. Bender Coal Company. Additionally, several of the smaller discharges are being treated by the Cooney Brothers Coal Company. The discharge from the abandoned Dean clay mine flows untreated into Brubaker Run. Flow from the Dean Clay Mine is discharging at approximately 250 gal/min with a pH of 3.1, 180 mg/l of iron, 20 mg/l of aluminum, and around 550 mg/l of acidity. As of now there is no treatment on this discharge or plans to construct any system to treat it. However, there have been multiple studies characterizing and investigating this discharge. Due to the high level of interest in developing a treatment system it is very likely that some type of treatment will be constructed to treat the Dean Clay Mine discharge in the future.

The narratives above discuss local activities that are currently underway or will most likely happen in the near future. It is anticipated that there will be routine road maintenance, house construction, and other developmental activities within the surrounding area. The short term nature of those activities along with the limited construction disturbances will have no more than a short term minimal impact on the water quality, vegetation, fish and wildlife resources, or community resources (noise, air quality, traffic patterns). Cumulative impacts are not expected to be different than impacts discussed under alternative 1, except that there may be further improvements to stream water quality.

**Alternative 3: Construct the Cresson AMD Treatment Plant with an extraction well located on National Park Service property.**

## **1. Resource Values**

### **a. Historic & Cultural Resources**

In a letter dated September 11, 2014, the Pennsylvania Historical and Museum Commission-Bureau for Historic Preservation (PHMC-BHP) requested that an

archaeological survey be conducted on the Argyle Pump Station for the Cresson AMD Project in Cambria County, Pennsylvania. On October 23, 2014, GAI Consultants, Inc. conducted a Phase I a reconnaissance-level cultural resources investigation of the Argyle Pump Station. This reconnaissance was conducted to determine the probability for archaeological sites or historical and architectural resources to be present within the project area. The results of the reconnaissance survey revealed that the Argyle Pump Station contains significant disturbance and has a low probability to possess archaeological remains. These disturbances are a result from the construction of an existing gravel access road, overhead utilities, and a nearby wellhead. The disturbance was documented with digital photography and field notes. As a result of the disturbed project settings, no further cultural surveys are recommended at the Argyle Pump Station. These results will be summarized in a technical report that will be submitted to the PHMC-BHP, upon completion of the Phase I b survey for the overall Cresson AMD Project.

Approval of alternative 3 will have no impact on historic and cultural resources. Clearance was received from SHPO by letter dated July 21<sup>st</sup>, 2015.

#### **a-1. National Park Service Historic & Cultural Resources**

The Allegheny Portage Railroad Historic Site aims to preserve the history surrounding the first railroad to circumvent the Allegheny Mountains. The part of the park that the project will affect is previously disturbed and lies within a power line right of way. This area is not seen nor is it accessible to visitors of the park. If any historic or cultural artifacts are discovered during construction of this project, construction will halt and the artifact will be analyzed. Given the nature of the area to be disturbed, approval of alternative one will have no impact on historic and cultural resources of the park.

#### **b. Water (Hydrology, Quality, and Quantity)**

**Hydrology.** The hydrologic impacts to the treatment plant site will consist of re-grading a portion of the site and an increase of impervious cover to the site that will increase the amount of surface run-off. Man-made channels currently exist on site designed to direct surface run-off towards Trapp Run. Some of these channels will be removed and regarded. Encroachment of these channels will be covered under PA Code Ch. 105.12 (a) 16 restoration waiver. A storm water collection pond and a discharge channel will be constructed in order to handle the increased surface run-off. During construction of the treatment plant, erosion and sediment controls along with BMP's will be utilized to prevent excess sediment from leaving the site. The pipelines conveying the Gallitzin Shaft and the Cresson No. 9 mine waters will cross through some existing wetland areas. These wetlands will be affected during construction of the pipeline. During construction the soil will be excavated and placed alongside the ditch. After the pipeline

is constructed the soil that was removed will be placed back into the ditch so that the hydric soils may be preserved. This should have no more than a short term moderate impact of the wetlands encountered. Long term operation and maintenance of the pipeline should have no more than a short term minor impact on the wetlands due to general maintenance, repair or replacement of the pipeline. These impacts will be covered under a PA Code Ch. 105 General Permit.

**Water Quality.** . Under alternative three, this project will have no more than a long term moderate, beneficial impact on Clearfield Creek and Sugar Run. As mentioned above Clearfield Creek and Sugar Run are impacted by acid mine drainage and are on the Commonwealth of Pennsylvania's Federal Clean Water Act Section 303(d) List of Waters as impaired by AMD. This project will protect and enhance the current fishery in the upper 15 miles of Clearfield Creek. The Cresson No. 9 and the Gallitzin Shaft mine discharge to tributaries of Clearfield Creek (Trapp Run and Bradley Run respectively). There have been fish kills reported in the Cresson Lakes during high flow due to the discharge from the Cresson No. 9 mine. Treatment of the Cresson No. 9 discharge would remove acidity and iron from Clearfield Creek. If treated in combination with the Gallitzin Shaft discharge, essentially all the acidity, iron and aluminum would be removed from the 4.2 miles of Clearfield Creek upstream of Amsbry, and fishing should recover in this segment, including the Cresson Lakes. The section from Amsbry to Brubaker Run, a distance of about 13 miles, should improve markedly from its present marginal condition. Additionally a wetland complex exists on Trapp Run downstream of the Cresson No. 9 discharge. When the treatment plant comes online it will eliminate the Cresson No. 9 discharge, preventing it from flowing into Trapp Run. Subsequently, the Cresson No. 9 discharge will no longer pollute or provide any water to this wetlands complex. The Argyle/Stone Bridge discharge is by far the largest acid source affecting its receiving stream, Sugar Run. Treatment will remove about 65% of the acidity, 32% of the iron load and 73% of the aluminum load from Sugar Run between the discharge and the Altoona area. The current highly degraded condition of about five miles of Sugar Run should greatly improve. Tributaries immediately downstream of the mine discharge on Sugar Run should provide sufficient flow so that removal of the mine discharge should not significantly impair Sugar Run base flow. With the removal of this discharge, Bureau of Conservation and Restoration lower tier restoration goals should be achieved. Lower tier goals include biological restoration, including where applicable a recreational fishery and the following in stream contaminant concentrations must be met during normal stream flow conditions: pH > 6.0, alkalinity > acidity, total Fe < 1.5 mg/l, total Al < 0.5 mg/l, and TDS < 1,500 mg/l.

**Water Quantity.** There is a potential that lowering the mine pool will impact the operation of the water supply wells in this area. In anticipation that the water wells could be affected by the fluctuation of the water level in the Gallitzin Shaft Mine Pool, the cost of replacing the private water supplies by installing a pipeline from the nearest public water supply was developed. The Vampire Road properties are located in Gallitzin Township and the nearest public water supplies are the Gallitzin Water Authority and the Cresson Municipal Authority. Either of the two public water supplies could provide water to the Vampire Road area. Based on conversations with the Gallitzin Water Authority and the engineer for the Cresson Township Municipal Authority, both suppliers have sufficient capacity to supply Vampire Road. The Cresson Township Municipal Authority would have sufficient head to supply Vampire Road and less pipeline would be required because the connection point is closer. An additional waterline extension will be constructed to service some additional residents along State Route 53 that may be impacted by the lowering of this mine pool. This waterline will be continued from Gallitzin Township down to and along State Route 53.

The treatment plant will discharge into Trapp Run providing excess clean water to the wetland. With the excess water flowing into Trapp Run there will be a potential for scouring to take place. With this in mind, energy dissipating structures may need to be constructed within Trapp Run. With the Cresson No. 9 discharge being eliminated and additional clean water being supplied to the complex, there should be no more than a positive long-term minor impact on the wetland.

#### **b-1. National Park Service Water (Hydrology, Quality, and Quantity)**

**Hydrology.** Under alternative three, this project should have no more than a long term negligible impact on the hydrologic resources of the National Park Service property. During construction of the project, BMP's along with erosion and sediment controls will be deployed to prevent any excess sediment from leaving the project site. A dry mine void exist between the surface and the underlying Lower Kittanning mine pool. Water analysis of the wetlands located down slope of the project site and of the underlying mine complex determined that there is no hydrologic connection of the two water bodies. The wetlands numbered 6 and 7 in the "Field Report prepared 04-24-14 by Kathy Penrod, ALPO" state that preliminary conclusions indicate there is no connection between the discharge from the Argyle/ Stone Bridge Mine Pool and ALPO resources. Water from the Argyle/ Stone Bridge Mine Pool (source of AMD to Sugar Run) will be pumped to the surface and then subsequently injected into the dry Tunnel Hill Coaling Mine void. When dealing with underground mining there is always a chance for subsidence to occur in the overlying areas of the mine. The mined area beneath the National Park area ranges between 250 and 390 feet deep. The Argyle/ Stone Bridge mine pool will be treated like a reservoir. The water within this pool will be kept at specific elevations with a minimum and maximum water front. This minimum and

maximum water front area does not underlie any of the iconic historic buildings of the Allegheny Portage Railroad Historic Site. The mine void that exists under these structures is dry and should not be affected by this project. Based upon a study conducted by Tetra Tech "Cresson Acid Mine Drainage Abatement Project Subsidence Investigation" there is a low probability that subsidence will occur on National Park Service property due to the associated activities of this project.

**Water Quality.** Within the project site, erosion may increase during the construction and development of the site. Total suspended solids along with turbidity of the surface run off may be increased during the construction phase of the project. BMP's along with erosion and sediment controls will be utilized to mitigate the increase in suspended solids leaving the site and water turbidity(see attached E&S controls). This project should have no more than a short term, negligible impact on NPS Water Quality.

**Water Quantity.** Surface run-off from precipitation and snow melt may increase slightly during the construction and development phase of the site and during the long term operation of the site. The project site is approximately 1.14 acres. Portions of the project area will eliminate or restrict water infiltration and slightly increase surface run-off. This project should have no more than a long term, negligible impact on NPS water quantity.

#### c. Vegetation

Plant and conveyance line construction will involve clearing the site locations of vegetation. The Plant site consists of a previously disturbed area with sparse vegetation. The extraction well and conveyance line from the Gallitzin Shaft Mine falls within a well maintained power line right of way. The extraction well and conveyance line from the Cresson No.9 Mine falls on undisturbed forested land. Two of the sludge injection wells are located in the immediate vicinity of the plant and the third will be located on undisturbed forest land. The two conveyance pipelines will be reseeded with grasses and maintained in order to access the lines for routine maintenance. Routine maintenance may also include periodic refurbishing and replacement of sewer and sludge disposal conveyance lines. This may involve the excavation of existing line, repair or replacement, and backfilling of the excavated area and revegetation.

The waterline extension that will be built to service the residents of Vampire Road will be constructed within a previously disturbed area within the roadway corridor. This will consist of clearing the area of vegetation and digging a trench along the road for placement of the waterline.

Given that most of the project will be located on previously disturbed areas with either sparse or well-maintained vegetation, alternative 3 will have no more than a long term minor impact on vegetation.

### **c-1. National Park Service Vegetation**

During the construction operations on National Park Service property the vegetation will be cleared and the access road will be improved. A 40 foot by 40 foot stone pad with a subsequent 10 foot by 15 foot concrete pad will be constructed, in which the extraction pump will be emplaced. Given the fact that this area lies on a power line right of way that consist of grasses and shrubs there will be no more than a long term negligible impact on the vegetation of the park service.

Routine maintenance may involve cleaning of pipelines, replacement of pipelines, fixing or replacing different parts of the pump, or the total replacement of the pump. This should have no subsequent impact on the vegetation due to the fact that the pump location will not be revegetated after initial construction. The only part that will be revegetated will be the pipeline from the extraction well to the injection well. The following erosion and sedimentation plan will be utilized to minimize site impacts.

The BMPs to be utilized for this project include compost filter sock, rock construction entrances, rock improvement for existing access road, compost filter sock drill cutting dewatering area, compost filter sock concrete washout, pumped water filter bag, and temporary and permanent vegetation. Compost filter socks will be removed after the disturbed areas have been stabilized with a uniform 70% vegetative cover of erosions resistant perennial species, or gravel. The rock construction entrances, gravel access road improvements, and well pad area will remain in place after construction is completed. Each of the BMPs are discussed individually in the paragraphs below.

- **Compost Filter Sock:** Compost filter socks will be installed down gradient of disturbed areas where indicated on the Plan Drawings. Compost filter socks will be held in place with wooden stakes. The compost filter socks will remain in place and maintained as long as the up gradient areas are active. Compost filter sock will also be installed around soil stockpiles.
- **Compost Filter Sock Drill Cutting Dewatering Area:** Drill cuttings from the construction of the wells will be stockpiled separately from other excavated or staged materials. These soils will be completely contained within a bermed area (comprised of 24-inch compost filter socks), underlain with 30 mil plastic sheeting. A sump will be excavated at one end of the dewatering area and the area will be graded such that it drains towards the sump. Drill cuttings will be staged at the up gradient end of the dewatering area so that water drains into the sump. Water will be pumped from the sump and into the newly constructed injection well as necessary. As drill cuttings are dewatered, the soil can be spread evenly over this site and graded flat. Drill cuttings may be dewatering in stages and spread over the site if necessary to make room for dewatering more drill cuttings. After all drill cuttings have been dewatered, the

remaining drill cuttings can be used to fill the sump and/or be spread on-site and graded to final contours.

- **Compost Filter Sock Concrete Washout:** The flumes of the concrete truck that pours concrete at the site and/or concrete mixing equipment shall be washed at the concrete washout area. A compost filter sock washout will be constructed with 24-inch compost filter sock placed in a circle and held in place with concrete blocks. The encircled area shall be lined with 30 mil plastic sheeting such that liquids and concrete material does not leak outside the compost sock.
- **Rock Construction Entrance and Well Pad Area:** A rock construction entrance (RCE) will be installed at the entrance of the First Energy power line right-of-way at Federal Park Road. Another RCE will be constructed which will traverse the First Energy power line right-of-way from the western edge to the eastern edge where the well pad will be constructed in order to connect the existing access road and the ASB Well Pad Area. The RCEs will minimize transport of soil and sediment from the work area and will be used during construction activities as the ingress and egress to the site. The rock well pad will be constructed with the same materials as the RCE in the configuration shown on the Plan drawings. These construction entrances and the well pad area will be maintained throughout the construction period and will remain in place when construction is complete.
- **Gravel Improvement for Existing Access Road:** The existing access road for the overhead power line that is owned and operated by First Energy will be used to access the site from Federal Park Road. This existing road will be improved as necessary before work begins at the ASB Well Pad Area. Improvements will be made by filling ruts and potholes with AASHTO #1 stone to prevent further degradation of the existing road. No grading will be done and no stone will be placed outside the limits of the existing access road.
- **Pumped Water Filter Bag:** This BMP will be used in the event that excavated trenches receive storm water runoff or if trenches are infiltrated with groundwater.
- **Temporary and Permanent Stabilization:** Disturbed areas that are at final grade will be vegetated with permanent seed mix immediately upon reaching final grade. Soil stockpiles or other work areas that will be inactive for more than 20 days will be seeded with the temporary seed mix. Permanent seeding will be done with a native seed mix as shown on the Standard Worksheet for temporary and permanent seeding that is included on E&S Detail sheets. Temporary or permanent seeding shall be applied as appropriate until the entire disturbed area to be seeded is stabilized with uniform 70% vegetative cover of erosion resistant perennial species.

Overall routine operation and maintenance will have no more than a short term minimal impact on National Park Service property vegetation.

#### **d. Fish & Wildlife Resources**

Construction of the treatment plant will permanently displace wildlife from the site. Given the nature of the site, with sparse vegetation, abandoned refuse, and poor soil quality renders this site with relatively little wildlife value. The construction of the extraction and injection wells, the conveyance lines, and waterline extensions will temporarily displace wildlife only during the construction phase of the project. During long term operation and routine maintenance of the extraction wells and conveyance lines, the habitat disturbed during construction will return. These activities will have a long term minor effect on fish and wildlife resources in the immediate project area.

As discussed under the project needs section, this project will markedly improve water quality in Clearfield Creek, Bradley Run, Trapp Run and, Sugar Run. With the addition of higher water quality and the elimination of the discharges; fish, macro invertebrates, and other aquatic organisms will return to these affected areas. This will establish a healthy supply of food for upper tier predators in turn increase and improve fish and wildlife habitat in and along the aforementioned streams. The long term operation of the treatment plant should have a long term moderate impact on fish and wildlife resources in the project area. The Pennsylvania Natural Diversity Inventory (PNDI) search conducted indicated federal threatened or endangered species (Indiana Bat and the Northern Long-eared Bat) exist on or near the project site. Through further review, The U.S. Fish and Wildlife Service determined that no adverse effects to this species are likely to occur. Clearance for the project was obtained from United States Fish and Wildlife Service, by letter, on 07/09/2015.

##### **d-1. National Park Service Fish & Wildlife Resources**

The construction and long term operation and maintenance of the extraction well that will be located on Park Service property will permanently displace wildlife from the extraction well location. With this area being previously disturbed and routine human activities taking place to maintain the power line right of way, impacts should be minimal. Power line vegetation maintenance could include trimming trees, spraying of herbicide, mechanically cutting sapling trees within the corridor, removing danger trees that could fall on the distribution line, removing ash trees that could be affected by the Emerald Ash Borer, and cutting patrol paths. The vehicles and machinery associated with these activities may include bucket trucks, chippers, and pickup trucks. More intensive power line vegetation maintenance is scheduled to occur every 4 to 5 years with intermittent minor activities occurring every 1 to 2 years. Given the nature of the

area and the size of the area that will be affected this project will have no more than a long term minimal impact on National Park Service Property fish and wildlife resources.

#### **e. Soils**

Given the disturbed nature of most of the sites involved in the construction of the treatment plant, it is unlikely that there will be any adverse effects to the soils in these areas. The treatment plant will be placed in an area that is dominated by coal refuse and previously disturbed soils. The permanent development of the site and the day to day operations of the plant will have no more than a long term negligible impact.

The pipelines that will be used to transport water from the extraction wells to the treatment plant will be placed in a ditch approximately four feet underground. The soil that is removed from the ditch will be used to fill it in after the construction of the pipeline. The sludge disposal line that runs from the plant down along Trapp Run will use the same route as the extraction well pipeline that comes from the Cresson No. 9 mine pool. This will limit any excess soil disturbance in the area. Routine operation and maintenance of the pipelines may include accessing man holes along the pipeline to clear any obstructions that may occur within the pipeline or for just routine flushing of the pipelines. These activities will result in no more than a short term negligible impact.

The two waterline extensions that will service residents along Vampire Road and residents along State Route 53 will be constructed in the same fashion as the conveyance pipelines. The waterlines will be placed in a ditch approximately four feet deep and buried by the same soil removed from the ditch. The waterline extensions will be placed in previously disturbed soils within the Gallitzin Township public right of way. The waterlines will have hydrants and general access points placed along their lengths. Routine operation and maintenance would consist of flushing waterlines, general repairs and the occasional replacement of the waterlines themselves. During routine operation and maintenance of the waterlines there should be no further disturbance of the soils. Overall, the waterline extension will have no more than a short term negligible impact on the soils along Vampire Road and along State Route 53.

#### **e-1. National Park Service Soils**

The construction of the extraction well and the supporting facilities will consist of the following: building a 40 foot by 40 foot gravel pad with a subsequent 10 foot by 15 foot concrete pad to house the extraction well and the submersible turbine pump; improving the existing access road to allow smooth and easy access to the site; digging a ditch approximately 4 feet deep to house the pipeline from the extraction well to the injection well approximately 50 feet away. The soil that is removed from the ditch, and holes for the pumps and motors of the extraction wells will be the same soil used to fill the areas back in when the construction of the pipeline and extraction well pumps and motors is

complete. During the development of this site, the previously described BMPs and erosion and sediment controls will be utilized to prevent any excess soil erosion and sediment from leaving the site.

Long term operation and maintenance of the site could consist of flushing and cleaning out the pipeline, replacing the pipeline, repairing and servicing the pumps and motors for the extraction wells, or replacing the pumps and motors all together. The soil disturbance that would occur would be replacement of the pipeline or replacing the pumps and motors; this would have no more than a short term minor impact on the soil. Given that the site has been previously disturbed, the permanent development of the site should have no more than a long term negligible impact on the National Park Service soils.

#### **f. Recreation**

The immediate plant site holds no significant recreational use; therefore the plant's construction and operation will have no impact on recreation. The construction of the conveyance system and the sludge injection lines run through undisturbed area where hunting and horseback riding has been observed. During construction these activities may be disrupted. Also, the conveyance lines will be running close to personal dwellings in which a variety of backyard and recreational activities may be taking place. The construction of the pipelines will have no more than a short term minor impact on these activities.

The plant's day to day operation will have some beneficial impacts on recreation. A total of about 21 miles of stream will be improved helping to restore a recreational fishery in the area. Parts of Clearfield Creek are on the current Pennsylvania Fish and Boat Commission's stocking schedule. This alternative should open up other areas in the headwaters of Clearfield Creek to be placed on the stocking schedule. This should be no more than a long term moderate impact on the watershed.

##### **f-1. National Park Service Recreation**

The section of the park that the extraction well is planned to be located on lies within a power line right of way. This area is unseen, unused, and inaccessible by park visitors. The initial construction and development of the site or any maintenance that will have to be done will create some added traffic in the area which may occasionally disrupt and delay traffic to the main section of the park. The day to day operations of the extraction well will occur solely in its immediate location and will have no effect on the park's recreational activities. In all, this project should have no more than a short term negligible impact on the recreational activities of the park. Given the small footprint of the proposed pump station (0.34 acres) located on the edge of the existing right of way for First Energy's power line, the proposed security fence and electrical panel should

have no more than a short term moderate impact during construction and a long term minimal impact during the long term operation and maintenance of the site.

#### **g. Geology and Geohazards**

For the areas covered by the three mine pools, the overburden thickness is 40 or more times the mined height of coal. Therefore, subsidence, if it were to occur, would take the form of a subsidence trough, or a warping of the ground surface to form a saucer-shaped depression. Trough subsidence could occur wherever mine level support is lost due either to crushing of the coal pillars or to punching of the coal pillars into the mine floor. The potential for mine subsidence was estimated by GAI by calculating the factors of safety of the coal pillars. Based upon the review of the available mine maps and data collected, it has been concluded that there is currently a low risk of subsidence above the mine pool areas that will be managed as reservoirs. Lowering the mine pools is not expected to induce mine subsidence at the sites. However, the potential for mine subsidence always exists in areas anytime underground mining has occurred. Therefore, it is recommended that all residents in these areas purchase mine subsidence insurance.

##### **g-1. National Park Service Geology and Geohazards**

For the Argyle/Stone Bridge mine pool none of the mined pool reservoir area was classified Category 3 (Areas where subsidence may have occurred or may occur in the future). As stated previously, the Argyle/Stone Bridge mine extends down dip toward Gallitzin and is between 40 and 400 feet below the ground surface. In general, the mine pool is deeper at the southern end and becomes shallower towards the northeast end of the mine pool where it discharges into Sugar Run. The depth of the cover at the southern end of mine pool is between 240 feet and 400 feet while the cover at the northeast end of the mine pool is only 40 feet in some areas. Because the potential for mine subsidence exists in areas underground mining has occurred, (see the detailed explanation in section g. Geology and Geohazards above), there should be no more than a long term negligible impact to NPS property due to this project.

#### **h. Noise and Lighting**

Construction activities related to the treatment plant, AMD and sludge conveyance lines, the waterline extension, stream and road crossings and the development of access will generate short term noise impacts. The noise impacts will largely be confined to the treatment plant zone and along the conveyance lines as vegetation is removed, refuse is regraded, ponds are excavated, and construction traffic accesses the site for development of the plant.

Construction of the plant facility, the AMD collection & conveyance and the sludge disposal lines, and the waterline extension will result in increased construction traffic. Traffic disruption will be temporary during construction and will largely be confined to the construction areas. The short term presence of the work force will result in increased revenues for small businesses for food and personal services. Some local residents may be hired to perform construction related duties.

The construction of the AMD conveyance, sludge conveyance lines, and development of AMD collection structures and the boreholes will result in short term elevated noise levels for the residents immediately adjacent to the construction area

The long term operation of the plant will not materially affect local noise levels. Plant related traffic and operation of the facility will result in occasional noise impacts. These are expected to be no more than long-term and minimal to the surrounding community, particularly due to the existing background noise from rail traffic in the area.

The treatment plant will utilize a lighting plan that will help insure a safe and efficient operation of the plant. At the plant its self, security lighting will be utilized to deter vandalism and trespassing of any unauthorized personnel into the site. The security lighting will contribute to light pollution. The pump stations will all utilize a light plan that is dark sky compatible. The sum effects of all the lighting from this project should have no more than a long term minimal adverse impact on light pollution.

#### **h-1. National Park Service Noise and Lighting**

Construction activities associated with the extraction well planned to be located on park service property will generate short term noise impacts. Noise impacts will be due to construction equipment and increased traffic to the area during construction and development of the site. No noise should be generated by the pump or the motor associated with the extraction well. The pump and motor will be placed underground to mitigate any noise that they may create. The only thing that will be exposed on the surface will be a 4 foot by 6 foot electronic control box and an 8 foot high security fence. With the pump and motor being placed underground, noise impacts caused by the long term and continued operation of the extraction well will be negligible. There will be no more than a short term moderate impact to noise levels caused by the initial construction and development of the site.

The lighting plan that will be utilized at the pump station planned to be located on NPS property will be dark sky compatible. A light switch will be installed at this site in order to turn the lights on and off when needed. The only time lights will be used at this site is

when night time maintenance is necessary. There should be no more than a long term negligible adverse impact to light pollution on NPS property.

## **Impacts of Operation and Maintenance**

### **2. Cumulative Impacts**

At this time there are seven other projects or jobs that have been identified and should be taken into consideration for having a cumulative impact on Clearfield Creek and Sugar Run during the life of this project. The seven projects or jobs consist of E.P. Bender Coal Company Inc. surface coal mine, two passive treatment sites with in the Sugar Run watershed, and four projects of the Clearfield Creek Watershed Association, which are the Klondike Project, the West Ferris Wheel Project, the Brubaker Project, and the Amsbry Project.

**E.P. Bender Surface Mine.** This surface mine lies in the headwaters of Sugar Run. The surface mine permit was renewed on June 18<sup>th</sup>, 2014 and was originally issued in 1992. This mine has multiple discharges that fall under Chapter 87. Subchapter F. Surface Coal Mine: Minimum requirements for remining areas with pollution discharges. Depending on flow and precipitation, these discharges could have an impact on Sugar Run.

**Two passive treatment sites.** There are two passive treatment systems that are in the Sugar Run watershed currently treating acid mine drainage from abandoned mine lands. Both of these sites were funded through the bond forfeiture appeals process. Site 26 consists of a vertical flow system composed of mushroom compost and limestone. Existing ponds were used with most of the alkalinity being generated through an anoxic limestone drain. Site 26-A consist of two vertical flow systems, two settling basins, and a final wetlands. This site was constructed using existing ponds with alkalinity being produced through a vertical flow system. Both of these systems discharge into a tributary of Sugar Run called Gumtree Run.

**Klondike Project.** Little Laurel Run is a tributary to Clearfield creek. Little Laurel Run is highly degraded by multiple discharges that originate from abandoned surface and underground mines that are located within its drainage basin. Little Laurel Run is a large contributor to the acid loading to Clearfield Creek. Approximately 1/3 of the pollution loading to Little Laurel Run originates from the abandoned Klondike Mine. Clearfield Creek Watershed Association applied for and was awarded a Growing Greener grant for the design and permitting of two passive treatment systems to treat the Klondike Mine discharges. They were also awarded a subsequent Growing Greener grant for the construction of these two systems. The two systems started

treating water in November of 2007. These two systems are still functioning today. In June 2014 the systems had their compost and limestone refurbished.

**West Ferris Wheel Project.** The West Ferris Wheel site is located on Little Laurel Run about ¼ mile from the Klondike Site. It has two large discharges and one smaller one. The first large discharge flows at about 70 gal/min with a pH of 3.1, 14 mg/l of iron, and 117 mg/l of acidity. The second large discharge flows at about 90 gal/min with a pH of 3.3, 6.7 mg/l of iron, and 113 mg/l of acidity. In 2008 Clearfield Creek Watershed Association received a grant from the USEPA 319 funds for design and permitting of passive treatment systems to treat the discharges. The construction of the project is expected to start soon.

**Amsbry Project.** At the village of Amsbry, several AMD discharges flow into Clearfield Creek. There are five identified discharges in this area. Of these five, there are three sizable discharges that contribute the majority of the pollution in the Amsbry area. Clearfield Creek Watershed Association has already constructed two passive treatment systems with plans to construct another one to treat the third major discharge in the vicinity. They are planning to submit a Growing Greener grant in 2014 to fund this project.

**Brubaker Project.** Brubaker Run enters Clearfield Creek at Dean. Extensive clay and coal mining has taken place within the Brubaker Run drainage basin. Three abandoned clay mines are the major source of degradation in the watershed. Other smaller abandoned coal mine discharges exist as well. Currently, two of the clay mine discharges are being treated by E.P. Bender Coal Company. Additionally, several of the smaller discharges are being treated by the Cooney Brothers Coal Company. The discharge from the abandoned Dean Clay Mine flows untreated into Brubaker Run. Flow from the Dean Clay Mine is discharging at approximately 250 gal/min with a pH of 3.1, 180 mg/l of iron, 20 mg/l of aluminum, and around 550 mg/l of acidity. As of now there is no treatment on this discharge or plans to construct any system to treat it. However, there have been multiple studies characterizing and investigating this discharge. Due to the high level of interest in developing a treatment system it is very likely that some type of treatment will be constructed to treat the Dean Clay Mine discharge in the future.

The narratives above discuss local activities that are currently underway or will most likely happen in the near future. It is anticipated that there will be routine road maintenance, house construction, and other developmental activities within the surrounding area. The short term nature of those activities along with the limited construction disturbances will have no more than a short term minimal impact on the water quality, vegetation, fish and wildlife resources, or community resources (noise, air quality, traffic patterns). Cumulative impacts are not expected to be different than

impacts discussed under alternative 2, except that there may be further improvements to stream water quality.

It should be noted that this project along with the other cumulative impacts listed above will have a net beneficial impact to the Clearfield Creek and Sugar Run watersheds.

## **F. PROJECT SCOPING**

### **1. Exploratory Drilling**

1. The objective of the exploratory drilling program is to advance five test borings to the depth of the coal seams (4 into the Cresson No.9 Mine and 1 into the Stone Bridge Argyle B seam Mine at BH-2) and to encounter a mine void at each location.(Cresson No.9 will have three sludge injection holes and one extraction well. BH-2 at Stone Bridge Argyle will be an extraction well.) The sludge injection holes will be completed and cased as described below. The extraction well locations will be determined with the exploratory drilling, but the wells will not be completed. Surface casing with a locking cap can be used to mark the location of the proposed extraction wells and will allow the exploratory holes to temporarily serve as monitoring wells until the permanent extraction wells are completed.

- a. The specific location for an extraction well at Borehole BH-2 was determined and exploratory drilling for this borehole was included in this project phase.
- b. Three borings will be installed at proposed locations for sludge injection wells into the Cresson No. 9 Mine. It will be determined whether to inject the sludge into the E Seam or the B Seam. Additional information about the coal structure geological information about the mines will be obtained as a result of the exploratory drilling into the upper Freeport and Lower Kittanning mines. The three borings will be completed and cased with the appropriately designed diameter casing material such that the sludge injection wells will be constructed as part of this exploratory drilling program.
- c. One boring into the Cresson 9E seam will be drilled during this project phase and may be developed into an extraction well under the construction phase.

2. The cost for drilling will be based on a total estimated drilling footage of 3200 feet, which allows for a total of eight boreholes at an average depth of approximately 400 feet per boring. This allows for three extra boreholes in the event that a mine void is not encountered and a borehole must be abandoned; or in the event that a mine void is not encountered, the borehole will be abandoned by backfilling the borehole hole with bentonite chips (hole plug) to the ground surface.

3. Select specific locations for the borings based on a field assessment and review of mine maps and other available information.

## **2. Mine Pool Routing Design**

1. The total mine pool storage volume is made up of three individual mine pools so the mine pool routing plan must consider the management of each individual mine pool.
2. Water from the Argyle/Stone Bridge mine will be pumped into the Tunnel Coaling Mine and drain by gravity to the Gallitzin Shaft Mine.
3. The Gallitzin Shaft and Cresson No. 9 extraction pumps will both discharge directly to the proposed treatment plant. The total discharge rate from both extraction wells must meet the total treatment plant inflow requirement of 4,400 gpm.

## **3. Mine Water Extraction Wells and Conveyance System Design**

1. Each extraction well must be capable of operating over a range of flow rates in order to manage the mine pools. The proposed pump discharge rates are based on the average recharge rates for each of the mine pools and the storage volume of each mine pool. The pumps must be capable of operating at the average flow rates in the range of 2.1 MGD in dry months to 3.8 MGD during wet months. The extraction wells for the Gallitzin Shaft and Cresson No.9 Mine pools must be capable of delivering 4,400 gpm in order to meet the treatment plant capacity of 6.3 MGD.

## **4. Vampire Road Water Line Extension**

1. The Vampire Road area located above the Gallitzin Shaft mine pool has several new homes with private water supply wells that could potentially be impacted when the water level in the mine pool is lowered. If the water wells are affected by the fluctuation of the water level in the mine pool, a replacement of the private water supplies could be provided to the homeowner's by installing a pipeline from the Cresson Municipal Authority's or Gallitzin Water Authority's distribution system.

## **5. Treatment Process Development and Final Plant Layout**

1. Develop conceptual plan for plant layout and solicit BCR input on layout. This process will allow BCR to comment on major design decisions and understand the consultant's vision for the type, size, and operational capacity of the plant before the design is implemented. The following information will be included in the conceptual layout: 1. Type and size of building used by the operator to control plant; 2. Lime silo location and size, 3. Size and material for Pre aeration tank and type of pre aeration system; 4. Type and location of Flocculation system; 5. Size and material used for

Reaction tank; 6. Size and material used for Clarifier; 7. Size and location of H<sub>2</sub>O<sub>2</sub> system.

2. Mass Balance and Process Flow Diagram (PFD)
3. Piping and Instrumentation Diagrams (P&ID)
4. Facility Arrangement Drawings
5. Hydraulic Profile
6. Interconnecting Piping Drawings – these will include enough detail to show the contractor where and what size/type of piping is to be installed. These will not be pipe spool drawings.
7. Process component specifications
8. Treatment Process Automation
  - i) A System Description will describe how the instrumentation and equipment work in tandem to ensure the treatment system operates correctly.
  - ii) Control Loop Descriptions will describe in detail the hardwire functions, alarms, hand operations, automatic operations, and SCADA set points.
  - iii) Programmable Logic Controllers (PLC) is intended to be used with this system. Write a performance specification for a contractor to bid on to supply the PLC's for the system.
  - iv) Develop a design for a Motor Control Center (MCC)
  - v) Write a performance specification for a vendor to set up the data infrastructure to stream data to the internet, similar to what has been done for the Lancashire No. 15 AMD Plant.

Develop a performance specification from which the contractor can complete control panel design.

## **6. Geotechnical Site Investigation and Structural Design**

1. Perform additional, as needed, subsurface site investigations at the proposed treatment plant location to obtain information and data that will be used to complete foundation design and construction of the AMD treatment facility.
2. Utilizing the determinations and recommendations from the Geotechnical Investigation, develop building, tank and equipment foundation design.
3. Complete final earthwork design for the treatment plant construction, which will include excavation bracing requirements, fill placement, and grading specifications.
4. Complete final earthwork design for the treatment plant construction, which will include excavation bracing requirements, fill placement, and grading specifications.

## **7. Civil Site Design**

1. Perform the detailed site design and plans including the erosion and sedimentation control plan, storm water management plan, subdivision and land development plan (if required), utilities, driveway, parking area, fencing, final grading, and landscaping.
2. Also included in civil site design will be sustainable design practices.
3. Develop effluent piping design from the treatment plant to Trapp Run, including roadway crossing.

## **8. Public Information / Involvement**

1. Write a performance specification for a subcontractor to develop a website which will be updated regularly with project news and information.
2. Attend up to 2 meetings in the Cresson area, which will be open to the public. One will be during design to address any unforeseen concerns. The second will be upon completion of final design. Make sure Vampire Road property owners are specifically invited and be prepared to discuss extension of public water line.

## **9. Flood Analysis of Clearfield Creek and Local Tributaries**

Treated water from the Cresson mine will be discharged at a maximum rate of 6.3 million gallons per day (MGD), or 9.75 cubic feet per second (cfs). A qualitative assessment was performed to identify the potential impacts this discharge would have on 100-year flood levels downstream of the discharge site. The following additional tasks will be performed to assess the impacts of flow increases on both Trapp Run and Clearfield Creek, building upon the initial analyses performed and described in the June 2012 Summary Report.

1. Provide recommendations on modifications, if any, for Trapp Run to handle treatment plant effluent flow.
2. Analyze Clearfield Creek, downstream of Sportsmen Club dam to the bridge on SR1005 to verify the stream's ability to carry the additional flow from the treatment plant.

## **10. Alternative Energy and Sustainable Design Analysis**

1. Incorporate solar panels into site designs, so that solar power can be used to offset electricity costs. Calculate and present payback period of the proposed design. This will need to be approved by DEP prior to design completion.
2. If deemed practical through a feasibility study, implement micro-hydro electric generation into the design. This will be approved by DEP prior to implementation.
3. Incorporate geothermal energy generation to heat and cool the control building.

4. Evaluate in further detail the use of sustainable design practices and incorporate into design where practical with DEP approval.

### **11. Plant Facilities and Control Building Design**

1. Complete balance of plant designs including control building design including architectural, plumbing telephone, restrooms control center, storage area, backup power for computers and instrumentation and HVAC.
2. Balance of plant design will include security, lighting, signage, storage, utilities, service water and potable water supply.
3. The facility design shall be in accordance with all applicable current codes including OSHA requirements, PA Department of Labor & Industries Uniform Construction Code (UCC), and the National Electric Code (NEC), latest editions.

### **12. Sludge Handling and Disposal**

1. Evaluate alternative locations for sludge injection wells, based on information from the exploratory drilling.
2. Select the site for the sludge injection borehole and at least one back-up location and design the sludge injection boreholes simultaneous to or prior to exploratory drilling such that the sludge disposal wells can be constructed as part of the exploratory drilling program.
3. Provide the pipeline design from the underflow sludge pump to the sludge injection boreholes complete with size, materials, pressure rating, pipe supports and other information required for a contractor to construct the pipeline..
4. The sludge injection boreholes locations recommended in the June 2012 Summary Report would require that a railroad crossing permit be obtained to run piping from the treatment plant to the borehole locations.
5. Design access roads needed to service the pipeline and borehole once in service and complete permit applications for environmental permits.

### **13. Electrical and Instrumentation**

1. Building electrical layout
2. Develop specifications for electrical equipment, instrumentation, communication systems
3. Develop specifications in such manner so that the constructor is able to design-build the control panel and DCS.
4. Develop Bill of Materials (BOM)
5. Conduct Studies as appropriate to complete electrical design
6. Utility Connection / Application / Coordination
7. Prepare all drawings necessary to communicate all electrical systems to be built

#### **14. Permits**

1. Complete all paperwork necessary to complete permit applications. Submit four (4) copies of each permit application to DEP. DEP will submit the permit applications, obtain the required permits, and pay all bonds and fees.

2. *DEP has stated that an NDPES Permit for industrial discharge and a Water Quality Management Permit for industrial discharge will not be required.*

3. The permits and permit activities to be completed under this subtask include:

- A. Environmental Field Review(s) and Wetland Delineation and Stream Identification Report(s)
- B. E&S Control Plan(s) (Cambria County Conservation District)
- C. NDPES Permit(s) for Storm water Associated with Construction Activities – Treatment Plant (General Permit PAG-02) NDPES Permit for Storm water Associated with Construction Activities – Mine Water and Sludge Pipelines (General Permit PAG-02)
- D. Water Obstruction Permit(s) or Waiver(s), GP-4 – Intake and Outfall Structure Water Obstruction Permit, GP-5 Utility Line Stream Crossing Water Obstruction Permit
- E. Utility connection applications to set up new service(s) Applications will be completed as necessary to set up new electrical and sewer service.
- F. Chapter 102 Permit(s) including Post Construction Storm water Management Plan.

The Total Impervious Surface Area to be Managed will be greater than 5,000 ft<sup>2</sup>.

Therefore, a Storm water Management Site Plan should be prepared and submitted to Cresson Township.

G. Road Occupancy Permit(s) for utility crossing.

- H. Heavy Haul Bond(s) for loads greater than 10 tons (municipalities).
  - I. Driveway Permit (s) for driving along pipeline right of way (municipalities).
  - J. Railroad Occupancy Permit(s).
  - K. Cultural Resource Evaluation(s).
  - L. Public Notification(s).
  - M. Present the project plans to the Cresson Township Supervisors in conjunction with their sub-division ordinance.
- Well Permit Application(s).

#### **15. Property Easements**

1. Identify affected properties, owners and contact information for the boreholes, pump stations, pipelines, utilities, treatment plant and any other related appurtenances.

Provide maps showing all properties affected by the project.

2. Obtain appraisals for all property to be purchased, and determine standard values for permanent right-of-ways.

3. Obtain temporary construction easements for the properties needing them, using DEP-approved forms.
4. Obtain permanent right-of-ways, where needed.
5. Complete all work necessary to complete property purchase for treatment plant and transfer of property from Pristine Resources to DEP, including survey and subdivision of property and local government approvals.

#### **G. PERSONS AND AGENCIES CONTACTED TO ASSIST IN THE PREPARATION OF THE ENVIRONMENTAL ASSESSMENT**

1. Charles Cravotta, USGS.
2. Fred Sherfy, former Office of Surface Mining employee.
3. GAI Consultants, Inc.
4. National Park Service.
5. Pennsylvania Department of Conservation and Natural Resources.
6. Pennsylvania Fish and Boat Commission.
7. Pennsylvania Game Commission.
8. Pennsylvania Natural Heritage Program.
9. Tetra Tech, Inc.
10. U.S. Fish and Wildlife Service.

#### **H. PREPARERS**

Joseph Hoy, Geologic Specialist  
Commonwealth of Pennsylvania  
Department of Environmental Protection  
Bureau of Conservation and Restoration  
Cambria Office

## **I. REFERENCES/ ATTACHMENTS**

**All Attachments are on enclosed CD**

1. 30% Design Development Report. Pennsylvania DEP AMD Abatement Project, Cresson AMD Treatment Plant, Cresson Township, Cambria County, Pennsylvania: GAI Project Number: C111385.01 December, 2013
2. 60% Design Submittal. Pennsylvania DEP AMD Abatement Project, Cresson AMD Treatment Plant , Cresson Township, Cambria County, Pennsylvania: GAI Project Number: C111385.01 May, 2014
3. ALPO Natural Resource Condition Assessment, Natural Resource Report NPS/ALPO/NRR—2013/727
4. ALPO Summit Preliminary Water Quality Sampling, Field Report prepared 04-24-14 by Kathy Penrod, ALPO.
5. Clearfield Creek Watershed Association, [clearfieldcreekwatershed.org](http://clearfieldcreekwatershed.org), projects: Klondike project, West Ferris Wheel project, Amsbry project, Brubaker project. Accessed July, 2014
6. Cresson Acid Mine drainage Abatement Project Subsidence Investigation: Tetra Tech, GAI Consultants Inc. July, 2014
7. Cresson Acid Mine Drainage Project Cambria and Blair Counties, Pennsylvania: GAI Project C110823.01, Task 008 June, 2012
8. Erosion and Sediment Controls for National Park Service.
9. Final Report, Phase 1 SRB Low Flow Mine Storage and Treatment Project Evaluation. GAI Project Number: C060164.10 May, 2007
10. Phase 1 Archeological Investigation, 13 May, 2015.
11. Sugar Run Watershed Assessment and Restoration Plan, Blair County Conservation District, September, 2003
12. The First World Atlas of the Artificial Night Sky Brightness, July, 2001. P. Cinzano, F. Falchi, and C. D. Elvidge.
13. Unanticipated archeological discoveries procedures document.
14. USDA Natural Resources Conservation Service Web Soil Survey, June, 2014

15. Wetland and Waterway Report for Travel, Allegheny Portage Railroad National  
Historic Site (Summit Area), 17-20 September, 2012