Snitz Creek #2 Stream Restoration Project

Cornwall Borough, Lebanon County, Pennsylvania

Growing Greener Plus Grant Application

July 2018

CLEAR CREEKS CONSULTING

1317 Knopp Road, Jarrettsville, Maryland 21084

(410) 692-2164

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Prepared for
Quittapahilla Watershed Association

Prepared by

Clear Creeks Consulting

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Snitz Creek #2 Stream Restoration Project
Detailed Project Description

I. Statement of Environmental Need

The Quittapahilla Creek Watershed is situated in the Ridge and Valley physiographic region in Lebanon County, Pennsylvania. Quittapahilla Creek is a tributary to Swatara Creek and is part of the Susquehanna River Basin. Its headwaters begin just southeast of Lebanon, Pennsylvania and it enters the Swatara Creek near North Annville, Pennsylvania.

The major land use in the watershed is agricultural. There are significant areas of urbanization along the Route 422 corridor in the City of Lebanon, West Lebanon, Cleona, and Annville. In addition, new development in the watershed is replacing farms with suburban communities. Past and current land use and land management practices in the rural areas, suburban communities, and urban centers have resulted in degraded water quality, stream bank and bed erosion, sedimentation, flooding, and the loss of riparian and in-stream habitat throughout the Quittapahilla Creek Watershed.

The Pennsylvania Department of Environmental Protection (PADEP) conducted studies in the 1980's and 1990's that indicate impairment of aquatic resources in the Quittapahilla Creek Watershed. In fact, the mainstem as well as all of the major tributaries to the Quittapahilla Creek are listed as impaired in the 303(d) listings. The 2000 305(b) Report prepared by DEP indicates that there are 88.9 miles of stream in the Quittapahilla Creek Watershed. Only 1.82 miles of stream (2%) were found to support designated aquatic life uses. The identified land use activities contributing to impairment include agriculture, crop related agriculture, urban/storm sewers, and bank modification. Sources of impairment include nutrients, siltation, suspended solids, organic enrichment/low dissolved oxygen concentrations, flow alteration, and other habitat alterations.

The Total Maximum Daily Loads (TMDLs) Report (PADEP, 2000) cites excessive sediment and nutrient levels as a major water quality problem in the Quittapahilla Creek Watershed. The report indicates that these pollutants are causing increased algae growth, large accumulations of fine sediments on the streambed, and degradation of in-stream habitat. Although the report attributes the excessive sediment and nutrient levels principally to agricultural activities, these pollutants are also associated with other upland sources (e.g., urban runoff) as well as in-stream sources (e.g., stream bed and bank erosion).

Since 1998, the Quittapahilla Watershed Association (QWA) has been working with a number of private organizations and public agencies to improve the water quality and aquatic habitat of Quittapahilla Creek. However, until 2001 there had been no comprehensive assessment, nor coordinated effort to identify and prioritize water quality, habitat and stream channel stability problems throughout the watershed. As a consequence, targeting of stream reaches for improvements had been on a project-by-project basis.

The QWA believed that their best chance for resolving the existing problems and avoiding future problems was to step back from the project-based approach and develop a comprehensive plan of action based on an assessment of the entire watershed. They believed that this approach would serve to focus funding and restoration and management efforts where they are most needed. They also believed that it is the approach that has the greatest chance for long-term success.

Accordingly, in 2000 the QWA contracted Clear Creeks Consulting to conduct an assessment of Quittapahilla Creek Watershed and develop a restoration and management plan focused on addressing the problems identified by the assessment. In cooperation with the QWA, Clear Creeks formed an interdisciplinary team that included; Skelly & Loy, Inc.; U.S. Fish & Wildlife Service, Chesapeake Bay Field Office; Penn State Institutes of the Environment, Pennsylvania State University; Department of Biology, Lebanon Valley College; and U.S. Geological Survey, New Cumberland Field Office. Supported by Growing Greener Grants received from PADEP in 2001 and 2003, the Assessment Phase of Quittapahilla Watershed Project was completed between 2001 and 2005 and the Planning Phase between 2005 and 2006.

The major components of the Assessment Phase included analysis of natural and man-made watershed characteristics and their influence on the hydrologic and sediment regime of the watershed; geomorphologic stream assessment; subwatershed reconnaissance and analysis; ecological assessment of habitat and biological communities; water quality modeling; water quality monitoring; and problem identification and prioritization. The Planning Phase of the project focused on identifying and prioritizing Best Management Practices (BMPs) to address the problems identified in the subwatersheds and along the main stem of Quittapahilla Creek. This included a comprehensive evaluation and prioritization of general, as well as site specific BMPs for controlling agricultural and urban runoff; and a comprehensive evaluation of general, as well as site specific restoration measures to correct stream stability and habitat problems. In addition, county, city and township land use, land development, environmental, and resource protection policies and programs were evaluated. Recommendations were developed for policies and programs focused on stream, wetland and floodplain protection and management.

As noted, the Quittapahilla Watershed Restoration and Management Plan (2006) included BMPs identified for controlling runoff from urban land and agricultural land, as well as projects focused on streambank stabilization and riparian buffer plantings along unstable stream reaches of the mainstem Quittapahilla Creek and its major tributaries. However, the QWA was working under the assumption that they would spearhead the stream/riparian restoration efforts while the City of Lebanon and the other Townships in the watershed would move forward with implementation of the urban BMPs. They also assumed that USDA-NRCS and the Lebanon County Conservation District would take the lead on implementing agricultural BMPs.

At the time the Restoration and Management Plan was prepared, deadlines for meeting MS4 requirements were still years away for the City of Lebanon and the other Townships in the watershed. Undeterred, the QWA resolved to move forward with implementation of the stream restoration projects identified in their Restoration and Management Plan. Utilizing Growing Greener Grants the QWA proceeded with design, permitting and construction of restoration projects along the mainstem Quittapahilla Creek. The major obstacle slowing their restoration efforts has been a lack of funding. The QWA determined that they would seek other funding sources. In order to qualify for 319 funding they decided to prepare the USEPA required Watershed Implementation Plan (WIP).

Funded by a 2016 Growing Greener Grant, the first steps in developing the USEPA Approved WIP were initiated in March 2017 and involved bringing the QWA members and representatives of local municipalities up to speed on what was involved in the original Quittapahilla Creek Watershed Assessment, what has been accomplished since the completion of Quittapahilla Watershed Restoration and Management Plan, and what remains to be done to prepare a Watershed Implementation Plan. In addition, the QWA formed working committees for each WIP task:

Utilizing the original list of restoration projects from the Restoration and Management Plan, a preliminary projects list was prepared for the Prioritization Committee to review. The four major tributary subwatersheds and each project within a subwatershed were evaluated relative to its contribution to pollutant loadings based on water quality modeling, observations recorded during the field reconnaissance survey and subsequent assessments. Projects that fell outside of the QWA's ability to control the outcome, such as those involving removal of concrete flumes, bank stabilization in quarries and on golf courses were dropped from the list.

The Prioritization Committee prioritized the four tributary subwatersheds in descending order, with Snitz Creek being the highest priority, Killinger Creek second, Beck Creek third and Bachman Run fourth. It was agreed that projects would be completed by priority subwatershed starting at the top of the watershed and working in a downstream direction. Projects representing severe conditions and contributing high sediment loadings would warrant moving out of order.

The final WIP document includes pollutant loading reduction estimates by subwatershed and pollutant loading reduction estimates by projects within subwatersheds. Cost estimates for design and permitting, cost estimates for construction, and total project costs were developed for all of the prioritized projects. Specific funding sources were identified for each prioritized project. An implementation schedule was prepared that shows completion of all prioritized projects by 2030. This includes 69 projects in the subwatersheds and 19 projects along the mainstem Quittapahilla Creek.

With training provided by Clear Creeks Consulting, the QWA in cooperation with the Doc Fritchey Chapter of Trout Unlimited, Lebanon Valley College will provide routine monitoring to evaluate the success of the projects in meeting the water quality and habitat objectives of the WIP. The detailed monitoring plan is outlined in the WIP. QWA and DFTU will assume responsibility for maintenance of individual restoration projects.

The WIP also outlines how the QWA will continue their current public outreach and education efforts to enlist support for and promote public participation in the restoration of the Quittapahilla Watershed.

In preparing grant proposal requests for the Water Quality Improvement Projects along the Sunoco Mariner East 2 Pipeline Corridor Grant Program, the QWA evaluated the list of priority projects identified in our WIP document relative to Lebanon County Townships eligible for funding. The eligible townships include Cornwall, South Annville, South Londonderry, South Lebanon and West Cornwall. Snitz Creek, Project #2 is located in the Cornwall Borough. Although it has not been directly impacted by Mariner East 2 Pipeline Project, it is second on the priority projects list for Snitz Creek watershed. Snitz Creek watershed ranks first among the four subwatersheds covered by our WIP. That grant application was submitted on June 19, 2018.

At the urging of Scott Carney, the QWA is applying for funding under the Growing Greener Plus Grant Program to increase the likelihood that the necessary funds can be raised through a combination of these two grant programs and matching funds provided by Cornwall Borough, the landowners, QWA, LVC, DFTU and their consultants and contractor.

Justification for Funding

As outlined in the Special Watershed Initiatives, the proposed project meets eligibility based on:

- This project is consistent with DEP's Growing Greener Watershed Renaissance Initiative to fund the complete implementation of existing watershed restoration or implementation plans on small priority watersheds listed on DEP's Integrated Report list.

As outlined in the Priority Watersheds and General Priority Activities, this project meets all of the following criteria for General Priority Activities:

1. Construction of best management practices (BMPs) appropriate for the listed causes and sources of impairment in watersheds for which total maximum daily loads (TMDLs) have been developed.
2. Implementation of restoration, maintenance, and/or protection activities that are recommended in watershed-based plans that address sources of pollution of stream segments identified as impaired in the Integrated Report.
3. Projects implementing any of the following BMPs:
   - Riparian forest buffers
   - Streambank stabilization
   - Floodplain restoration on non-forested riparian lands
   - Wetland creation/restoration/enhancement
   - Urban/residential stormwater reduction/infiltration
   - Aquatic habitat improvement
4. Projects that support municipal separate storm sewer system (MS4) communities implementing BMPs consistent with their stormwater or TMDL pollution reduction implementation plan.

Snitz Creek, Project #2 is second on the priority projects list for Snitz Creek watershed. It represents an important next step in our continuing effort to implement those projects identified in our WIP for the Snitz Creek subwatershed. It will significantly reduce nutrient and sediment loadings to the Snitz Creek and Quittapahilla Watershed and will ultimately help us meet the TMDL goals for both watersheds.

Proposed Scope of Work

<u>Existing Conditions</u>

The reaches along this part of Snitz Creek were historically straightened with side castings from the channel excavation creating berms along the top of bank. The berms have separated the channel from its historic floodplain and confine stormflows in the channel. The results of a rapid geomorphic assessment conducted during the summer of 2017 indicated that the stream reaches through this project area are laterally and vertically unstable due to meander redevelopment and maintenance of riparian vegetation. Stability problems include high width to depth ratio, significant bank erosion, debris jams, heavy sedimentation, aggradation (lateral and mid-channel bars) and active head-cuts. Bank and bed erosion is a source of sediment to downstream reaches along Snitz Creek, Quittapahilla Creek, as well as Swatara Creek. Undercut trees are falling into the creek creating debris jams which further accelerates the bank erosion and aggradation. The increased sedimentation has significantly degraded in-stream habitat resulting in few, shallow pools and riffles that are highly embedded with fine sediments.

This section of Snitz Creek also receives direct stormwater runoff from agricultural cultivated fields along the right floodplain and urban runoff from the residential neighborhoods along the left floodplain. The following photographs documenting the existing conditions were taken along the project area in July 2017.

Bank erosion along Upper Project Reach near Cedar Street Cul-de-sac

Bank erosion, undercut tree, small debris jam and sedimentation along Upper Reach

Bank erosion and sedimentation along Upper Reach

Bank erosion, undercut tree and mid-channel bar along Middle Reach

Bank erosion, fallen tree, and large debris jam that includes old tires along Middle Reach

Bank erosion and undercut trees along Middle Reach

Multiple head-cuts at upstream end of Lower Reach

Bank erosion and undercut trees along Lower Reach

Restoration Objectives and Expected Environmental Benefits

This project proposes to restore 2,310 linear feet of Snitz Creek from the culvert outfall downstream of the Lebanon Valley Rail Trail to the culvert upstream of Culvert Road. The restoration design objectives are to create a stable meandering C4 stream channel along the upper and middle project reaches. Floodplain restoration will include the creation of a 2 – 2.5 acre emergent and scrub-shrub wetland along the adjacent right floodplain to capture and provide water quality treatment for direct runoff form the adjacent cultivated agricultural fields and urban runoff from residential neighborhoods in the left floodplain carried via storm sewers. The lower reach will be restored as a stable B4c stream channel. It will generally follow its existing alignment with some adjustments to the tighter meander bends. A concept of the proposed restoration is included below.

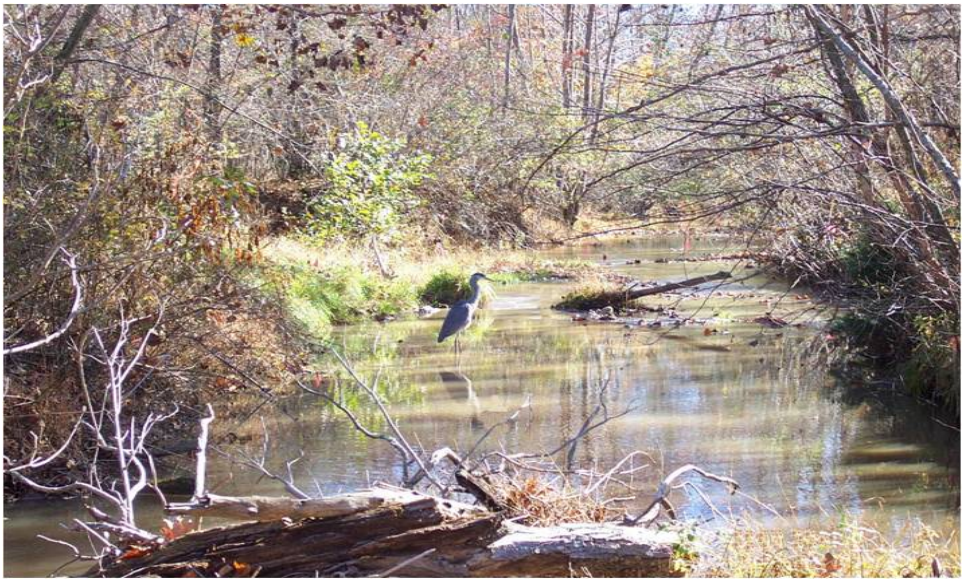
The restoration approach for the Upper and Middle Reaches will involve:

- Removing existing debris jams and junk from the channel;
- Constructing a meandering C4 channel for approximately 1,300 linear feet.
- The new channel will have a narrower cross-section with improved sediment transport capacity.
- Streambanks will be reconstructed and stabilized by Installing toe wood along the outside of meander bends to create the lower portion of the new streambank. Soil fabric lifts will be installed along the top of the toe wood to create the new upper streambank.
- The channel profile will be modified to create streambed features that increase the pool to riffle ratio and improve overall pool and riffle habitat.

- Grade control will be provided by installing constructed riffles composed of small boulders, cobble and gravel.
- The existing berms will be removed from along the adjacent right top of bank and floodplain.
- The floodplain will be excavated and graded to create a 2 – 2.5 acre wetland.
- The newly constructed streambanks, floodplain and wetland will be stabilized by seeding with native grasses and planting with native trees and shrubs.

Example of Toe Wood installed along outside of meander bend

Example of Constructed Riffle



Example of Created Wetlands

The restoration approach for the Lower Reach will involve:

- Removing existing debris jams and junk from the channel;
- Constructing a moderately sinuous B4c for approximately 1,010 linear feet.
- The new channel will have a narrower cross-section with improved sediment transport capacity along the currently over-wide sections.
- Streambanks will be reconstructed and stabilized by installing large boulder outcrops along the outside of meander bends to create the lower portion of the new streambank. Soil fabric lifts will be installed along the top of the rock outcrops to create the new upper streambank.
- The channel profile will be modified to create streambed features that increase the pool to riffle ratio and improve overall pool and riffle habitat.

- Grade control will be provided by installing constructed riffles composed of small boulders, cobble and gravel.
- The newly constructed streambanks will be stabilized by seeding with native grasses and planting with native trees and shrubs.

Example of Large Boulder Outcrops

The Snitz Creek #2 restoration project will reduce nitrogen, phosphorus and sediment loadings to Snitz Creek from streambank erosion and agricultural and urban runoff by 173.3 lbs./yr., 157.1 lbs./yr. and 103,672.8 lbs./yr., respectively. It will restore 2,310 linear feet of in-stream and riparian habitat.

Partnerships

Over the years, the QWA has formed a close working relationship with the Lebanon Valley Conservancy and the Doc Fritchey Chapter of Trout Unlimited (DFTU). The QWA and its partners have provided many hours of in-kind services. For this project, the Lebanon Valley Conservancy will provide administrative and contract management services. QWA and DFTU will coordinate with landowners to obtain the necessary Letters of Commitment and Letters of Agreement. They will also provide volunteers for installation of plant materials and post-construction monitoring and maintenance.

There are nine landowners along this project area. Initial contact made by representatives of QWA and TU indicate that all are interested in participating. The Krall Family has agreed to allow 2 acres of their cultivated field along the right floodplain to be converted into wetlands to support the project. Cornwall Borough is partnering with QWA, LVC and DFTU on the project to meet part of their MS4 requirements. They are contributing a $25,000 cash contribution that will go toward the construction costs of the project.

CONCEPT PLAN	# SNITZ CREEK 2	DATE: JUNE 2018
MAP NOT TO SCALE	SNITZ CREEK, QUITTAPAHILLA CREEK WATERSHED, LEBANON COUNTY, PA	PREPARED BY: ECOSYSTEM PLANNING & RESTORATION CLEAR CREEKS CONSULTING 1317 Knopp Road, Jarrettsville, Maryland 21084 (410) 692-2164

Contractor Provisions

The Quittapahilla Watershed Association, Doc Fritchey Chapter of Trout Unlimited and Lebanon Valley Conservancy want to implement this project as a design-build effort. They have asked the consulting team of Clear Creeks Consulting and Environmental Planning and Restoration (EPR) to prepare the restoration design plans and to obtain local, state and federal permits for this project. They have also asked Aquatic Resource Restoration Company (ARRC) to provide construction services to complete the restoration work.

Staff with all three firms were key members of the multidisciplinary team that conducted the original detailed assessment of the Quittapahilla Creek watershed. Clear Creeks prepared the Restoration and Management Plan (2006). Clear Creeks and ARRC have teamed to provide design-build services for the QWA and LVC to complete two restoration projects along the Quittapahilla Creek mainstem in the Quittie Creek Nature Park (2010 - 2016). They are also teaming to provide design-build services for a restoration project they will complete summer 2018 for the Doc Fritchey Chapter of Trout Unlimited along Lower Snitz Creek. Most recently Clear Creeks completed the Quittapahilla Creek Watershed Implementation Plan (2018) for QWA and LVC.

Given their outstanding work on the assessment, management plans and restoration projects, and the fact that they have been working closely with the QWA since 2000, the members feel they are the most qualified and best prepared consultants and contractor to help implement our stream restoration projects. The following scope of work outlines the services and deliverables they will provide under the grant funds we are requesting.

Detailed Scope of Work

<u>Phase 1 - Design and Permitting</u>

- Existing Conditions Survey and Base Map Preparation

  - Set up a GPS ground control network.
  - Field run topography will be utilized to develop design base maps along the Snitz Creek stream corridor (approximately 2,310 linear feet).
  - In addition, a field-run survey will be conducted to provide detailed channel topography. This will:
    - Extend 100 feet from top of bank along the right floodplain and 50 feet from top of bank along the left floodplain,
    - A longitudinal profile will be surveyed along the project reach. The profile survey will follow the thalweg and include channel bed, water surface, and top of bank profiles at key points (e.g., top and bottom of riffles, bottom of run, Dmax of pools, and top of glide, etc.);
    - A baseline will be established along the right floodplain for the entire length of the project reach.
    - Cross-sections will be established off the base-line, extending 100 feet from top of bank along the right floodplain and 50 feet from top of bank along the left floodplain and include key points along the channel (Apex of bends, mid-riffle, max depth of pools). Significant in channel features (e.g. bedrock outcrops) will be identified.
    - Identification and survey of any public or private utilities, such as sanitary sewer manholes, storm drain outfalls, phone and power poles, etc.

    - Survey upstream, downstream and through the stream sections at the culverts at the Lebanon Valley Rail Trail and Culvert Road with sufficient detail to allow hydraulic analysis of these structures.
    - Vertical and horizontal controls will be set.
- Develop the following base maps of the project area from the field run survey for use in developing restoration designs.
    - The plan view will be prepared at 1 in. = 20 ft. Cross-sections will be prepared at 1 in. = 5 ft. vertical and 1 in. = 5 ft. horizontal. Longitudinal Profile will be prepared at 1 in. = 5 ft. vertical and 1 in. = 20 ft. horizontal.
    - The plan view will include topography at one-foot contour intervals in the channel and across the floodplain/terraces and adjacent hill slopes to either side of the channel;
    - It will show existing structures, such as buildings, retaining walls, fences, roads, drainage pipes, and culverts;
    - Major stream features (e.g., point bars, depositional areas, rock outcrops, etc.) will be shown.

➢ Hydrologic and Hydraulics Analysis

- Utilizing standard hydrologic modeling methods (TR-20) develop the peak discharge rate for the 1-, 2-, 10-, 50- and 100-year 24-hour storms under existing conditions for the project reach. The model will be calibrated to regional regressions and/or the FEMA 100-year published flow data so as to serve as the basis for analyzing in the following flood plain modeling effort.
- Utilizing the 1-, 2-, 10-, 50 and 100-year flows developed from the hydrologic analysis and regional regressions, conduct existing and proposed hydraulic analyses for the project reach. Traditional methods including HEC-RAS will be used to approximate and model existing and proposed water surfaces and hydraulic parameters associated with these flow events.
- The HEC-RAS model will also import the HEC-2 data from the detailed FEMA modeling used for the Flood Insurance Rate Mapping of the project area. This cost estimate assumes that we will be able to develop a model that reflects less than 0.01 foot flood water surface elevation change to remain consistent with PADEP regulations.
- If, however this cannot be achieved, it will become necessary to proceed through the process to obtain a Conditional Letter of Map Revision (CLOMR) and Letter of Map Revision (LOMR) process with FEMA. This effort is estimated to require an additional effort to complete this procedure.

➢ Field Studies and Design Criteria

- Conduct Level II and Level III Geomorphic Assessment
- Collect and analyze bulk sediment to verify sediment transport capacity
- Determine design bankfull channel dimensions.

➢ Preliminary Design Plans

- Utilizing the field-run topography and base maps, hand drawn preliminary design plans will be prepared. The plans will include: plan view sheets, representative cross-section sheets, structure typical details, and preliminary landscape plans for the Snitz Creek corridor.

- Final Design Plans and Construction Documents

    - Prepare final restoration design plans utilizing the field-run topography and base maps. The plans package will include: grading plans, cross-section sheets, profile sheets, and grading typical details, and final landscape plans for the Snitz Creek corridor.
    - Prepare a Design Report that summarizes the results of the field studies, existing/proposed conditions hydrologic and hydraulic analysis, sediment transport analysis, and supporting engineering computations for the restoration/stabilization of Snitz Creek project reach.
    - Prepare Erosion and Sediment Control Plans including sequence of construction; stockpile and staging areas, clean water diversion, sediment and erosion control measures,
    - Prepare quantity estimates for materials, and final engineer's cost estimates for materials and construction.
    - A Professional Engineer licensed in the state of Pennsylvania will review, sign and seal the final design plans.

- Local State and Federal Permit Applications

    - Conduct environmental assessments required for permitting including wetland delineation, archeological, historical, RET, etc.
    - Conduct a pre-application field meeting with the local, state and federal permitting agencies to present the concept design plans, discuss overall project goals and objectives and site specific constraints.
    - Prepare Erosion and Sediment Control Submittal Package.
    - Prepare Joint Permit Application packages for submission to the Quittapahilla Watershed Association. The authorized representative for the QWA will sign and forward the permit application package to the permitting agencies.
    - Prepare written responses (with accompanying plan revisions) to agency comments and or questions..

<u>Phase I Deliverables</u>

- Preliminary Design Plans
- Final Design Plans
- Final Design Report
- Construction Specification Documents
- Permit Application Package

<u>Phase 2 - Construction</u>

- Construction Over-Sight and Construction Management

    - Attend pre-construction meeting at the project site. During this meeting construction plan details, construction sequencing, and other special provisions will be discussed with the contractor;
    - Prior to construction, review contractor submittals for materials and visit suppliers with the contractor to ensure conformance with the specifications in the Contract Documents;

- During construction, provide periodic and routine on-site construction supervision of the channel restoration and installation of specific bank stabilization measures, flow diversion structures, grade control structures, and bank and riparian plantings;
- Prepare any necessary plan modifications during construction due to unanticipated circumstances beyond the project scope;
- After construction is completed, conduct a preliminary acceptance walk-through with QWA representatives, landowners, and the Construction Contractor and prepare a punch list outlining any outstanding work items;
- Conduct a final inspection and site walk with QWA representatives, landowners, and the Construction Contractor;
- Prepare Final Report required by Funder.

➢ Construction

- Mobilize hauling and stockpiling materials on-site;
- Install construction access entrances;
- Install sediment and erosion control measures and pump diversion;
- Excavate channel and grade streambanks in accordance with design plans and specifications;
- Install in-stream structures including - constructed riffles, log-boulder J-Hooks, cross vanes, toe benches, boulder rock outcrops, and soil lifts in accordance with design plans and specifications;
- Stabilize graded areas daily; apply temporary and permanent seed and fertilizer; install erosion control matting;

➢ Landscaping

- Seed all disturbed area along streambanks and floodplain
- Install live stakes along toe benches;
- Install live branch cuttings in soil lifts
- Plant trees and shrubs on graded banks and floodplain.

➢ As-Built Survey

- Conduct an as-built survey of the restored channel to the same level and detail as the existing conditions topographic survey
- Prepare as-built plans including plan view, longitudinal profile and cross-sections.

➢ Post Construction Monitoring

- Conduct post construction monitoring as required by the Permitting Agencies and outlined in the Permit Conditions.

<u>Deliverables</u>

- The project will provide 2,310 linear feet of restored channel along Snitz Creek and a 2 – 2.5 acre wetland that will capture and provide water quality treatment agricultural runoff from adjacent cropland.
- As-Built Survey Plans

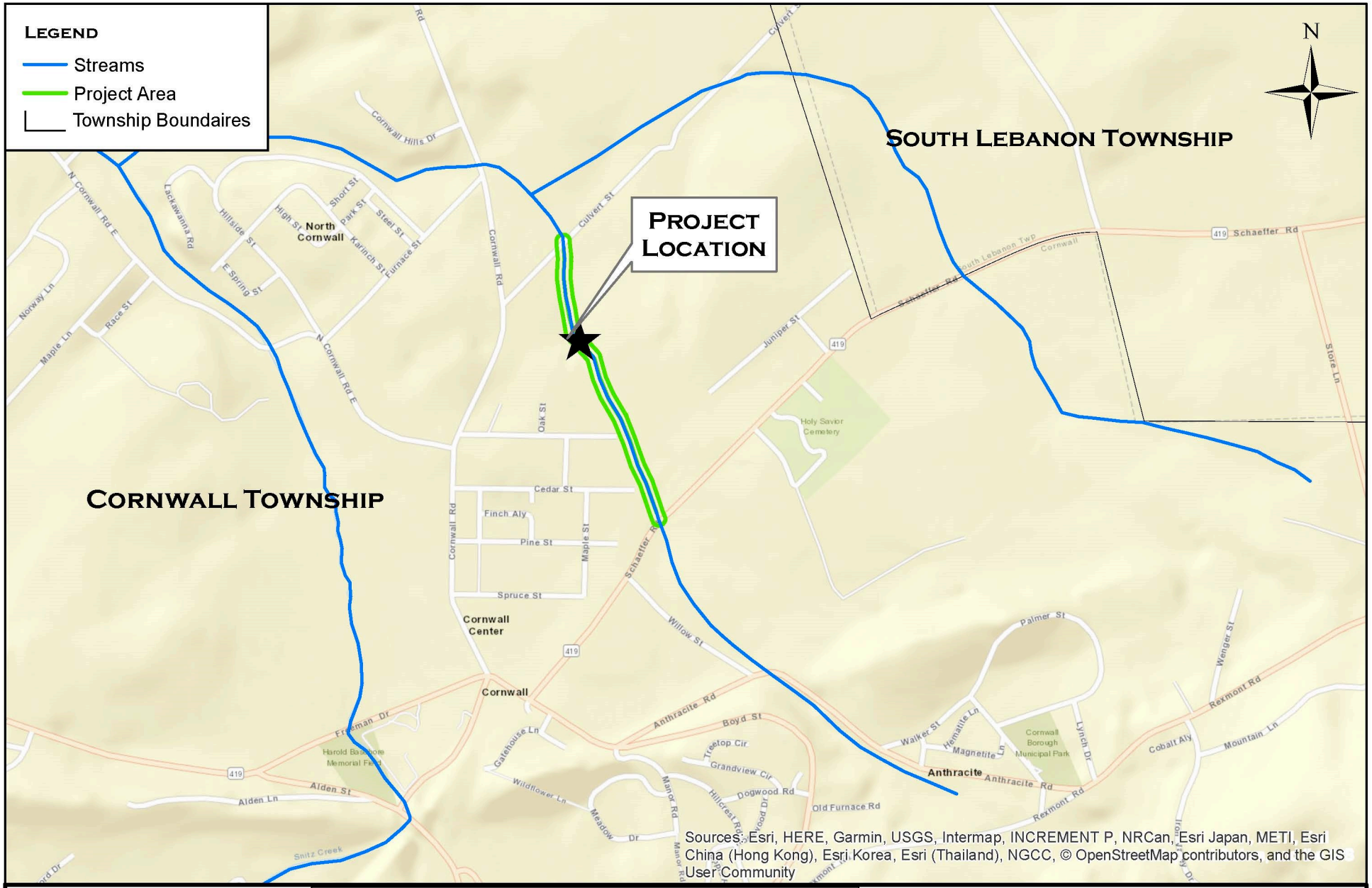
Project Schedule

Task	Start and Completion Dates
Phase 1 – Design and Permitting	
Existing Conditions Topographic Survey and Base Maps	NTP – Day 45
Hydrologic and Hydraulic Analysis	NTP – Day 45
Field Studies and Design Criteria	NTP – Day 45
Preliminary Design	Day 45 – Day 60
Final Design and Construction Documents	Day 60 – Day 90
Local, State and Federal Permitting	Day 90 – Day 270
Project Coordination, Meetings and Site Visits	On-Going
Phase 2 – Construction	
Construction Over-Sight and Construction Management	On-Going
Construction	Day 270 – Day 390
Landscaping	Day 280 – Day 400
As-Built Surveys and As-Built Plans	Day 400 – Day 445
Post-Construction Monitoring	Day 445 plus 5 YRS

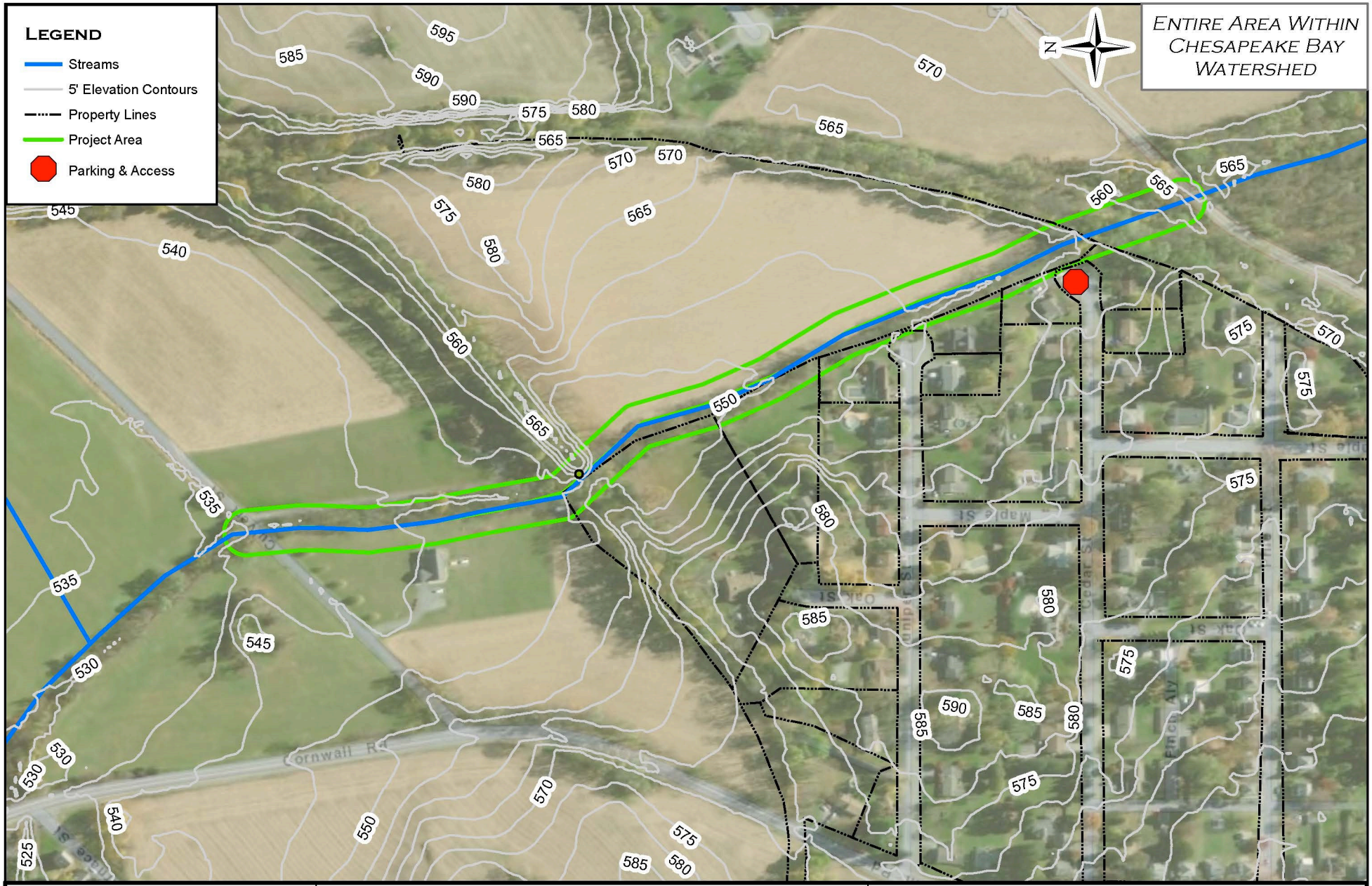
The QWA intends to utilize the funds requested under this grant application to develop the restoration design plans, obtain permits, and implement the project. We plan to move forward with construction as soon as permits have been issued. Construction is planned for 2020. If we are unable to obtain full funding for our grant request we will break the project into phases, with Phase 1 including the Survey, Design and Permitting tasks and Phase 2 including Construction tasks.

Commonwealth Investment Criteria

Consulting firms, construction contractors, nurseries, and landscape companies depend primarily on private development and publicly funded projects for business opportunities. Publicly funded projects are critical for sustaining these businesses. An evaluation of the economic impact this project will have on the consulting firms, construction contractor, nursery and landscape company directly involved, as well as the quarries; heavy equipment leasing, parts and maintenance; fuel suppliers; and erosion control products materials and equipment suppliers indicates that a minimum of 20 permanent fulltime jobs would be retained. An additional 51 temporary fulltime jobs would result from this project.



Location Map	Snitz Creek 2	Date: June 2018
0 500 1,000 2,000 Feet	Snitz Creek, Quittapahilla Creek Watershed, Lebanon County, PA	Prepared by: Ecosystem Planning & Restoration (EPR); Clear Creeks Consulting, 1317 Knopp Road, Jarrettsville, Maryland 21084, (410) 692-2164



Site Map

Snitz Creek 2

Date: June 2018

0 150 300 600

Feet

Snitz Creek,
Quittapahilla Creek Watershed,
Lebanon County, PA

Prepared by:
Ecosystem Planning & Restoration
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Aerial Photo

0 250 500 1,000

Feet

Snitz Creek 2

Snitz Creek,
Quittapahilla Creek Watershed,
Lebanon County, PA

DATE: JUNE 2018

PREPARED BY:
Ecosystem Planning & Restoration
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Design and Permitting Scope of Work and Budget for
Snitz Creek Project 2 Restoration Project
(06/18/18)

Phase 1 – Survey and Preliminary Design

1.0 – Existing Conditions Survey and Base Map Preparation

The Team will:

1. Set up a GPS ground control network.
2. To the extent practical, topography from Lebanon County GIS database will be utilized to develop topographic base maps along the Snitz Creek stream corridor (approximately 2,310 linear feet).
3. The GIS topography will provide coverage for the 100-year floodplain along the corridor where work may be proposed.
4. In addition, a field-run survey will be conducted to provide detailed channel topography. This will include:
   a) The longitudinal profile will be surveyed along the project reach. The profile survey will follow the thalweg and include channel bed, water surface, and top of bank profiles at key points (e.g., top and bottom of riffles, bottom of run, Dmax of pools, and top of glide, etc.);
   b) A baseline will be established along the right floodplain/terrace for the entire length of the project reach.
   c) Cross-sections shall be established off the baseline, extending 25 feet on either side of the channel, and surveyed at 100 foot intervals and at key points along the channel (Apex of bends, mid-riffle, max depth of pools). Minimum points along a cross-section shall include start and end of cross-section, top of bank, toe of bank/edge of water, thalweg, centerline, and several points either side of center line).
   d) Significant in channel features (e.g. bedrock outcrops) will be identified.
   e) Identification and survey of any public or private utilities, such as sanitary sewer manholes, storm drain outfalls, phone and power poles, Sunoco pipeline, etc.
   f) Survey upstream, downstream and through the stream sections at the culverts at the Rail Trail and Culvert Road with sufficient detail to allow hydraulic analysis of these structures.
   g) Vertical and horizontal controls will be set.
   h) The field-run survey data will be tied into the GIS topography.
5. Develop the following base maps of the project area from the GIS, aerial, and field run survey for use in developing restoration designs.
   a) The plan view will be prepared at 1 in. = 20 ft. Cross-sections will be prepared at 1 in. = 5 ft. vertical and 1 in. = 5 ft. horizontal. Longitudinal Profile will be prepared at 1 in. = 5 ft. vertical and 1 in. = 20 ft. horizontal.
   b) The plan view will include topography at one-foot contour intervals in the channel and across the floodplain/terraces and adjacent hill slopes to either side of the channel. It will show existing structures, such as buildings, retaining walls, fences, roads, drainage pipes, culverts and bridges; Major stream features (e.g., point bars, depositional areas, rock outcrops, etc.) will be shown. $27,111.00

2.0 - Hydrologic and Hydraulic Analysis

The Team will:

1. Utilizing standard hydrologic modeling methods (TR-20) develop the peak discharge rate for the 1-, 2-, 10-, 50- and 100-year 24-hour storms under existing conditions for the project reach. The model will be calibrated to regional regressions and/or the FEMA 100-year published flow data so as to serve as the basis for analyzing in the following flood plain modeling effort.
2. Utilizing the 1-, 2-, 10-, 50 and 100-year flows developed from the hydrologic analysis and regional regressions, conduct existing and proposed hydraulic analyses for the project reach. Traditional methods including HEC-RAS will be used to approximate and model existing and proposed water surfaces and hydraulic parameters associated with these flow events.
3. The HEC-RAS model will also import the HEC-2 data from the detailed FEMA modeling used for the Flood Insurance Rate Mapping of the project area. This cost estimate assumes that we will be able to develop a model that reflects less than 0.01 foot flood water surface elevation change to remain consistent with PADEP regulations.
4. If, however this cannot be achieved, it will become necessary to proceed through the process to obtain a Conditional Letter of Map Revision (CLOMR) and Letter of Map Revision (LOMR) process with FEMA. This effort is estimated to require an additional $0.00 of effort to complete this procedure. $27,600.00

3.0 – Field Studies and Design Criteria

The Team will:

1. Conduct Level II and Level III Geomorphic Assessment
2. Collect and analyze bulk sediment to verify sediment transport capacity
3. Determine design bankfull channel dimensions. $3,500.00

4.0 – Preliminary Design

The Team will:

1. Utilizing the field-run topography and base maps, hand drawn preliminary design plans will be prepared. The plans will include: plan view sheets, representative cross-section sheets, structure typical details, and preliminary landscape plans for the Snitz Creek corridor. $12,150.00

5.0 – Final Design and Construction Documents

The Team will:

1. Prepare final restoration design plans utilizing the field-run topography and base maps. The hand drawn plans package will include: grading plans, cross-section sheets, profile sheets, and grading typical details, and final landscape plans for the Snitz Creek corridor. (Clear Creeks)
2. Draft in CADD the final hand drawn restoration design plans and landscape plans (EPR).
3. Prepare a final design report that summarizes the results of the field studies, existing/proposed conditions hydrologic and hydraulic analysis, sediment transport analysis, and supporting engineering computations for

the restoration/stabilization of Snitz Creek project reach. (Clear Creeks/EPR).
4. Prepare Erosion and Sediment Control Plans including sequence of construction; stockpile and staging areas, clean water diversion, sediment and erosion control measures, (Clear Creeks/EPR).
5. Prepare quantity estimates for materials, and final engineer's cost estimates for materials and construction. (Clear Creeks).
6. A Professional Engineer licensed in the state of Pennsylvania will review, sign and seal the final design plans.(EPR) $57,000.00

6.0 – Local State and Federal Permit Applications

The Team will:

1. Conduct environmental assessments required for permitting including wetland delineation, archeological, historical, RET, etc. (EPR)
2. Conduct a pre-application field meeting with the local, state and federal permitting agencies to present the concept design plans, discuss overall project goals and objectives and site specific constraints. (Clear Creeks)
3. Prepare Erosion and Sediment Control Submittal Package. (EPR)
4. Prepare Joint Permit Application packages for submission to the Quittapahilla Watershed Association. (Clear Creeks) The authorized representative for the QWA will sign and forward the permit application package to the permitting agencies.
5. Prepare written responses (with accompanying plan revisions) to agency comments and or questions. (Clear Creeks/EPR) $27,100.00

7.0 As-Built Survey and As-Built Plans

1. Conduct an as-built survey of the restored channel, floodplain and wetland areas to the same level and detail as the existing conditions topographic survey
2. Prepare as-built plans including plan view, longitudinal profile of new channel, cross-sections of new channel and wetlands. $24,801.00

8.0 – Project Coordination, Meetings and Site Visits

The Team will:

1. Attend Intra-Team office/field meetings to discuss project scheduling, hydrologic and hydraulic analysis, the findings of the field studies and subsequent recommendations, drafting of preliminary and final design drawings, and other project related issues.
2. Attend up to three (3) office/field meetings with the Quittapahilla Creek Watershed Association and property owners to discuss project scheduling, the findings of the field studies and subsequent recommendations, discuss landscaping issues, present preliminary and final design drawings, and other project related issues. $13,400.00

Phase 1 – Design and Permitting Professional Fees

Clear Creeks	$50,750.00
EPR	$102,000.00
Foothills	$39,912.00
Total Professional Fees	$192,662.00

Snitz Creek Project #2 Construction Estimate Prepared by Aquatic Resource Restoration Company

Snitz Creek (2,310 LF) and Wetland (2 acres)	Stream		Wetlands	
Project Coordination	$	12,000.00	$	1,500.00
Survey and GPS set Up	$	2,500.00	$	500.00
Construction Stakeout	$	6,500.00	$	2,500.00
Direct Expenses	$	14,000.00	$	2,250.00
Labor Setup/MOB	$	950.00	$	950.00
Labor Clearing	$	9,500.00	$	1,500.00
Labor E & S	$	14,800.00	$	1,200.00
Labor Stabilization	$	3,500.00	$	1,200.00
Labor Misc.	$	2,500.00	$	-
Heavy Equipment/Operator	$	283,500.00	$	70,800.00
Mobilization	$	20,000.00	$	4,000.00
Materials (Stone, wood and soil lift matting)	$	43,125.00	$	-
E & S Control Measures & Safety Fence	$	10,000.00	$	-
Stabilization	$	2,800.00	$	7,000.00
Dewatering & Cofferdam	$	42,250.00	$	-
Geo-textile, Pins & Nails	$	4,000.00	$	-
Erosion Control Matting	$	36,000.00	$	-
Trees/Shrubs & Tree shelters	$	3,600.00	$	9,000.00
Live Stakes	$	-	$	-
Wetland Plants	$	-	$	-
Total	$	-	$	-
	$	**511,525.00**	**$**	**102,400.00**

Total Construction Budget - $613,925

All excavation from wetland and stream channel stays on site
No export or import included in price

Mr. R. Scott Carney
Chief, Watershed Support Section
Department of Environmental Protection
Office of Water Resources Planning
Rachel Carson State Office Building
400 Market Street
Harrisburg, PA 17101

QWA
QUITTAPAHILLA WATERSHED ASSOCIATION

July 11, 2018

Dear Mr. Carney:

This letter confirms the enthusiastic support of the Quittapahilla Watershed Association (QWA) for a proposed stream improvement project on Snitz Creek in Lebanon County. A proposal for funding for the project is being submitted to the Pennsylvania Department of Environmental Protection (PA-DEP) under the Growing Greener Plus Grant Funding. Snitz Creek is a tributary to the Quittapahilla Creek, and the entire watershed is classified as "impaired" as a result of a TMDL analysis conducted by the PA-DEP (PA-DEP, 2000).

Snitz Creek Restoration Project No. 2 proposes to restore 2,310 linear feet of Snitz Creek from from the culvert outfall downstream of the Lebanon Valley Rail Trail to the culvert upstream of Culvert Road. The restoration will create a stable meandering stream channel along the upper and middle project reaches. Floodplain restoration in this area will include the creation of a 2 – 2.5 acre emergent and scrub-shrub wetland along the adjacent right floodplain to capture direct runoff form the adjacent cultivated agricultural fields and urban runoff carried by storm sewers in the adjacent residential neighborhoods along the adjacent left floodplain. The lower reach will be restored as a stable stream channel. It will generally follow its existing alignment with some adjustments to the tighter meander bends.

This project is part of a larger plan to restore the Quittapahilla Creek Watershed and reduce nutrients and sediment being transported from the Quittapahilla Creek to the Swatara Creek and eventually to the Chesapeake Bay. This project ranks as a priority among the many projects identified in the Watershed Implementation Plan (WIP) for the Quittapahilla Creek Watershed.

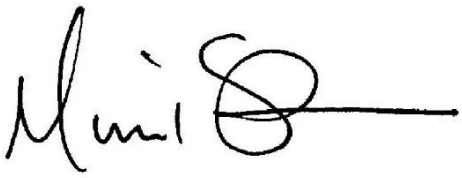
Our support for the project includes donation of our time and energy toward project success. In particular, the Quittapahilla Watershed Association will approach the landowners to introduce the project and explain the work to be done along with our expectations for success. We will coordinate with them to secure Landowner Letters of Commitment. Prior to project implementation we will coordinate with the landowners to secure Landowners Letters of Agreement. We value these contributions at $5,000.

During the construction phase, we will provide volunteers to assist in the installation of trees and shrubs along the project area. After construction will provide volunteers and trained college student interns funded by the QWA to conduct a 5-year monitoring effort to evaluate the success of the project and determine the need for maintenance.

Our volunteers will provide on-going maintenance, such as removal of invasive species. We value these construction related and long-term contributions at $20,000. Therefore, we are committing our organization to $25,000 worth of in-kind contributions to support the project.

The QWA is "dedicated to cleaner water flowing from the Quittie to the Swatara to the Susquehanna to the Chesapeake Bay to the Atlantic and beyond." The proposed project on Beck Creek will help us to achieve our goal.

Sincerely,



Michael Schroeder, President
Quittapahilla Watershed Association
189 School House Lane
Annville, PA 17003

Cc: Mr. Rocky Powell, Clear Creeks Consulting, Jarrettsville, MD
Mr. Russ Collins, President, Doc Fritchey Trout Unlimited, Palmyra, PA
Mr. Ned Gibble, President, Lebanon Valley Conservancy, Lebanon, PA
Mr. David Lloyd, West Cornwall Township Board of Supervisors

Reference

Pennsylvania Department of Environmental Protection, 2000, Total Maximum Daily Loads (TMDLs) Quittapahilla Creek Watershed, Lebanon County: Southcentral Regional Office, Water Management Program, 36 pp. + appendix.

Trout Unlimited
Doc Fritchey Chapter
P.O. Box 6592
Harrisburg, PA 17112
www.dftu.org
E: rwarrencollins@gmail.com
P: 717-580-3958

P.O. Box 227
Palmyra, PA 17078
July 11, 2018

Mr. R. Scott Carney Chief
Watershed Support Section
Department of Environmental Protection
Office of Water Resources Planning
Rachel Carson State Office Building
400 Market Street
Harrisburg, PA 17101

Dear Mr. Carney:

This letter confirms the support of the Doc Fritchey Chapter of Trout Unlimited (DFTU) for a proposed stream improvement project on Snitz Creek in Lebanon County. A proposal for funding for the project is being submitted to the Pennsylvania Department of Environmental Protection (PADEP) under the Growing Greener Plus Grant Funding. Snitz Creek is a tributary to the Quittapahilla Creek, and the entire watershed is classified as "impaired" as a result of a TMDL analysis conducted by the PADEP (PADEP, 2000).

The Snitz Creek #2 Restoration Project proposes to restore 2,310 linear feet of Snitz Creek from the culvert outfall downstream of the Lebanon Valley Rail Trail to the culvert upstream of Culvert Road. The restoration will create a stable meandering stream channel along the upper and middle project reaches. Floodplain restoration in this area will include the creation of a 2 – 2.5 acre emergent and scrub-shrub wetland along the adjacent right floodplain to capture direct runoff form the adjacent cultivated agricultural fields and urban runoff carried by storm sewers in the adjacent residential neighborhoods along the adjacent left floodplain. The lower reach will be restored as a stable stream channel. It will generally follow its existing alignment with some adjustments to the tighter meander bends.

This project is part of a larger plan to restore the Quittapahilla Creek Watershed and reduce nutrients and sediment being transported from the Quittapahilla Creek to the Swatara Creek and eventually to the Chesapeake Bay. . This project ranks as a very high priority among the many projects identified in the Watershed Implementation Plan (WIP) for the Quittapahilla Creek Watershed.
Our support for the project includes donation of our time and energy toward project success. In particular, the Doc Fritchey Chapter of Trout Unlimited will approach the landowners to introduce the

project and explain the work to be done along with our expectations for success. We will coordinate with them to secure Landowner Letters of Commitment. Prior to project implementation we will coordinate with the landowners to secure Landowners Letters of Agreement. We value these contributions at $5,000. During the construction phase, we will provide volunteers to assist in the installation of trees and shrubs along the project area.

After construction we will provide volunteers and trained college student interns funded by the DFTU to conduct a 5-year monitoring effort to evaluate the success of the project and determine the need for maintenance. Our volunteers will provide on-going maintenance, such as removal of invasive species. We value these construction related and long-term contributions at $20,000. Therefore, we are committing our organization to $25,000 worth of in-kind contributions to support the project.

Trout Unlimited is a grassroots, volunteer organization whose mission is "to conserve, protect and restore North America's trout and salmon fisheries and their watersheds." The proposed work on Snitz Creek would help us fulfill that mission.
Sincerely,

Russ Collins, President
Doc Fritchey Trout Unlimited

Cc: Mr. Rocky Powell, Clear Creeks Consulting, Jarrettsville, MD
Dr. Michael Schroeder, President, Quittapahilla Watershed Association, Annville, PA
Mr. Steve Danz, Borough Manager, Cornwall Borough, Cornwall, PA

Reference

Pennsylvania Department of Environmental Protection, 2000, Total Maximum Daily Loads (TMDLs) Quittapahilla Creek Watershed, Lebanon County: Southcentral Regional Office, Water Management Program, 36 pp. + appendix.

BOROUGH OF CORNWALL

44 Rexmont Road
Lebanon, Pennsylvania 17042
Phone (717) 274-3436 Fax (717) 450-5150
Website: www.cornwall-pa.com

July 11, 2018

Mr. Michael Schroeder
Quittapahilla Watershed Association
189 School House Lane
Annville, Pennsylvania 17003

Re: Snitz Creek Project #2 Stream Restoration

Dear Michael:

The Borough of Cornwall is pleased to partner with the Quittapahilla Watershed Association, Lebanon Valley Conservancy and Doc Fritchey Chapter of Trout Unlimited. We understand that you are currently seeking funding from Pennsylvania Department of Environmental Protection through two of their grant programs, Funding for Water Quality Improvement Projects along the Mariner East 2 Pipeline Corridor and Growing Greener Plus.

These funds will allow the design, permitting and implementation of the Snitz Creek Project #2 Stream Restoration in the Cornwall Borough. Once completed, the restoration project will protect private property and public infrastructure, reduce streambank erosion along the project reaches, and provide water quality treatment of stormwater runoff from agricultural fields and urban storm sewers, thereby reducing sediment and nutrient loads in Snitz Creek, Quittapahilla Creek and Swatara Creek watersheds.

This project is consistent with the overall water quality improvement goals identified in the Quittapahilla Creek Watershed Implementation Plan. It continues progress towards meeting TMDL requirements for the watershed and assists the Borough in meeting our MS-4 requirements. Therefore, the Borough of Cornwall is providing matching funds in the form of a $25,000.00 cash contribution to show our commitment to this project.

Thank you for the opportunity to partner with your organization. We look forward to assisting in the watershed stakeholder's efforts to improve the water quality of the Quittapahilla Creek Watershed.

Sincerely yours,

Steven Danz
Borough Manager

CLEAR CREEKS CONSULTING
1317 Knopp Road, Jarrettsville, Maryland 21084 (410) 692-2164

July 11, 2018

Mr. Michael Schroeder
Quittapahilla Watershed Association
189 School House Lane
Annville, Pennsylvania 17003

Re: Snitz Creek Project #2 Stream Restoration

Dear Michael:

Clear Creeks Consulting is pleased to support your efforts to obtain funds from Pennsylvania Department of Environmental Protection's Growing Greener Plus Grant Funding. These funds will allow the Quittapahilla Watershed Association to design, permit and implement the Snitz Creek Project #2 Stream Restoration in the Cornwall Township. Once completed, the restoration project will protect private property and public infrastructure, reduce bank erosion along the project reaches, provide water quality treatment for agricultural and urban runoff, reduce sediment and nutrient loads in Snitz Creek, Quittapahilla Creek and Swatara Creek watersheds, and improve in-stream habitat. This project will implement restoration efforts associated with a high-priority stream reach identified in the Quittapahilla Creek Watershed Implementation Plan completed in 2018.

Clear Creeks Consulting is providing matching funds in the form of in-kind services to show our commitment to this project. Our contribution of $30,000.00 is in the form of labor and direct expense costs in assisting the watershed association and the watershed stakeholders in coordinating with funders, land owners and the Township; preparing a work scope for design, permitting and construction; securing funding; administrative support time associated with the grant award; and technical support in terms of developing a phased approach to the project, training volunteers and interns for the 5-YR monitoring period, and providing analysis and interpretation of the monitoring data collected. This assistance is provided at no cost to you or the Grant Program.

Thank you for the opportunity to partner with your organization. I look forward to assisting in the watershed stakeholder's efforts to improve the Quittapahilla Creek watershed.

Sincerely yours,

Rocky O. Powell
Principal

Ecosystem Planning and Restoration, LLC
8808 Centre Park Drive, Suite 205
Columbia, MD 21045

Phone: (443) 979-7718
www.eprusa.net

Mr. Michael Schroeder
Quittapahilla Watershed Association
189 School House Lane
Annville, Pennsylvania 17003

July 11, 2018

RE: Growing Greener Grant Application Snitz Creek Project #2 Stream Restoration

Dear Michael:

Ecosystem Planning and Restoration, LLC (EPR) is pleased to support your efforts to obtain funds from Pennsylvania Department of Environmental Protection's Growing Greener Plus Grant Funding. These funds will allow the Quittapahilla Watershed Association to design, permit and implement the Snitz Creek Project #2 Stream Restoration in the West Cornwall Township. Once completed, the restoration project will protect public infrastructure, reduce bank erosion along the project reaches, provide water quality treatment for agricultural and urban runoff, reduce sediment and nutrient loads in Snitz Creek, Quittapahilla Creek and Swatara Creek watersheds, and improve in-stream habitat. This project will implement restoration efforts associated with a high-priority stream reach identified in the Quittapahilla Creek Watershed Implementation Plan completed in 2018.

EPR is providing matching funds in the form of in-kind services to show our commitment to this project. Our contribution of $5,000.00 is in the form of labor and direct expense costs in assisting the watershed association and the watershed stakeholders in preparing a work scope for construction, and permitting costs associated with the Snitz Creek Project #2 Stream Restoration, administrative support time associated with the grant award, and technical support in terms of developing a phased approach to the project. This assistance is provided at no cost to you or the Growing Greener Program.

Thank you for the opportunity to partner with your organization. I look forward to assisting in the watershed stakeholder's efforts to improve the Quittapahilla Creek watershed.

Sincerely,

Richard R Starr
VP, Senior Water Resources Scientist

Aquatic Resource Restoration Company
12506 Susquehanna Trail South
New Freedom, PA 17349
717.428.9368 • FAX 717.428.9411
www.arrc1.com

Mr. Michael Schroeder
Quittapahilla Watershed Association
189 School House Lane
Annville, Pennsylvania 17003

July 11, 2018

Re: Snitz Creek Project #2 Stream Restoration

Dear Michael:

Aquatic Resources Restoration Company is pleased to support your efforts to obtain funds from Pennsylvania Department of Environmental Protection's Growing Greener Plus Grant Funding. These funds will allow the Quittapahilla Watershed Association to complete the construction phase of the Snitz Creek Project #2 Stream Restoration in the West Cornwall Township. Once completed, the restoration project will protect private property and public infrastructure, reduce bank erosion along the project reaches, provide water quality treatment for agricultural and urban runoff, reduce sediment and nutrient loads in Snitz Creek, Quittapahilla Creek and Swatara Creek watersheds, and improve in-stream habitat. This project will implement restoration efforts associated with a high-priority stream reach identified in the Quittapahilla Creek Watershed Implementation Plan completed in 2018.

Aquatic Resources Restoration Company is providing matching funds in the form of materials and in-kind labor services to show our commitment to this project. Our contribution of $20,000.00 is in the form of construction management services and donated trees and shrubs, as well as labor to install these plants in the riparian buffer along the creek. This assistance is provided at no cost to you or the Grant Program.

Thank you for the opportunity to partner with your organization. I look forward to assisting in the watershed stakeholder's efforts to improve the Quittapahilla Creek watershed.

Sincerely yours,

Lee Irwin
President

Lebanon County Planning Department

Room 206, Municipal Building •400 South Eighth Street • Lebanon, PA 17042-6794
Phone: 717-228-4444 • Fax: 717-228-4453
Website: www.lebcounty.org • Email:LCPD_Planning@Lebcnty.org

June 15, 2018

Mr. Michael Schroeder
Chairman, Quittapahilla Watershed Association
189 School House Lane
Annville, PA 17003

RE: Water Quality Improvement Projects in Cornwall and West Cornwall Townships

Dear Mr. Schroeder:

This letter will confirm that the stream restoration projects that the Watershed Association is proposing to implement in Cornwall and West Cornwall Townships using grant funding for Water Quality Improvement Projects along the Mariner East 2 Pipeline Corridor are consistent with the Lebanon County Comprehensive Plan of 2007. The Watershed Association should be complimented on their continued efforts to restore the Quittapahilla Creek Watershed as it will assist us in meeting our goals and objectives for the protection of the County's natural resources as outlined within the Comprehensive Plan.

The Lebanon County Planning Department (LCPD) has a long-term working relationship with every municipality in Lebanon County. Accordingly, the LCPD is willing to assist the Quittapahilla Creek Watershed Association in serving as a liaison to the municipalities within the watershed.

I look forward to working with you as this projects progress. Please feel free to contact me with any questions.

Sincerely,

Julie Cheyney

Julie Cheyney
Executive Director

Sunoco Penalty Grant
QWA/TU Restoration Projects
Property Owners

Snitz Creek Project 2A

1. Left Floodplain Upstream to Downstream

Thomas and Carla Groff – Letter of Commitment
122 Cedar St.
Cornwall, PA 17016

Craig and Gale Martel – Verbal Commitment, Letter Pending Return form Vacation
121 Cedar St.
Cornwall, PA 17016

Christopher and Lauren Groff – Letter of Commitment
138 Juniper St.
Cornwall, PA 17016

Suzanne Dauberman and Jorge Rodriquez – Letter of Commitment
13 Oak St.
Cornwall, PA 17016

Robert and Tierany Dowd – Letter of Commitment
7 Oak St.
Cornwall, PA 17042

2. Only Property along Right Floodplain

Glen and Linda Krall – Letter of Commitment
180 Schaeffer Rd.
Cornwall, PA 17042

Snitz Creek 2B

1. Only Property along Left Floodplain

Dine and Ned Krissinger – Letter of Commitment
8 Culvert St.
Cornwall, PA 17042

2. Only Property along Right Floodplain

Daniel Stoner – Letter of Commitment
10 Culvert St.
Cornwall, PA 17042