
Beck Creek 6 – Stream and Floodplain Restoration Project
Water Quality Improvement Projects Grant: Water Quality Projects along MEII Pipeline
Final Report: Technical Report Section

Prepared for
The Lebanon Valley Conservancy

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A. Technical Report

1. Narrative Description of Project

a. Project Purpose

The Beck Creek 6 - Stream and Floodplain Restoration Project is located in the West Cornwall Township. It is one of seventeen restoration projects identified along Beck Creek in the Quittapahilla Watershed Implementation Plan. Although it is sixth of the seventeen priority projects identified for the Beck Creek subwatershed, it has been directly impacted by the Mariner East 2 Pipeline Project. This project represents an important first step in our effort to implement those projects identified in our WIP for the Beck Creek subwatershed. It will significantly reduce nutrient and sediment loadings to the Beck Creek and Quittapahilla Watershed, and will ultimately help us meet the TMDL goals for both watersheds.

The stream reaches through this project area have been significantly impacted by historic straightening, unlimited livestock grazing, and removal of riparian vegetation. Runoff from cultivated fields along the adjacent western slopes has also contributed significant loadings of sediment and nutrients to the creek. Stability problems include high width to depth ratio, streambank erosion, heavy sedimentation and aggradation (mid-channel bars) and debris jams. The increased sedimentation has significantly degraded in-stream habitat resulting in few, shallow pools and riffles that are highly embedded with fine sediments. During summer months overwide sections are choked with fine sediment and aquatic vegetation.

The funding obtained from this grant was intended to be utilized to develop final design plans and obtain local, state and federal permits for the project. More specifically, it involved:

- 1) Conducting a field-run topographic survey and preparing base maps to be utilized in developing the design plans;
- 2) Conducting hydrologic and hydraulic analyses of existing and proposed conditions;
- 3) Conducting geomorphic assessments and developing channel design criteria;
- 4) Conduct environmental assessments required for permitting including wetland delineations, archeological, historical, and PENDING investigations;
- 5) Preparing preliminary design plans;
- 6) Preparing final design plans, a final design report and construction documents;
- 7) Conducting a pre-application field meeting with the local, state and federal permitting agencies to present the preliminary design plans, discuss overall project goals and objectives and site specific constraints;
- 8) Preparing Erosion and Sediment Control Package for submission to the Lebanon County Conservation District;
- 9) Preparing Joint Permit Application Package for submission to PADEP and USACOE.

b. Actual Accomplishments

All of the intended tasks were accomplished and deliverables were produced:

- 1) Final design plans, a final design report and construction documents were prepared and are attached to this final report.
- 2) A Erosion and Sediment Control Package was completed and submitted to the Lebanon County Conservation District;
- 3) A Joint Permit Application Package was completed and submitted to PADEP and USACOE.
- 4) The Erosion and Sediment Control Plan has been approved.

- 5) Discussions with Jason Shirey, PADEP reviewer indicate that the state and federal permits are being processed and anticipated for approval prior to the end of June 2021.

- c. Successes

To fully appreciate how this project has succeeded thus far requires looking at the problems encountered and how they were overcome. See next section for detailed explanation.

- d. Problems Encountered

- 1) Groundwater Contamination

Our geomorphic assessment and wetland delineation field work began in late May 2019 and proceeded without issues. However, by mid-July 2019, our number one problem moving forward would be related to historic groundwater contamination on the Weaver Property. In spite of the fact that our work had no relationship to this contamination and that our survey crew had the approval of the landowner to access the property, community activists expressing concerns that the restoration work might cause the contamination to spread, stopped our surveyors from conducting the field run topographic survey work and called the police to have them removed from the site. The deputy sheriff who responded handled the situation and our crew was able to proceed with no further interruption. The disruption resulted in the loss of nearly a full day of work.

Unfortunately, this encounter caused the Quittapahilla Watershed Association (QWA) and Lebanon Valley Conservancy (LVC) to become concerned about the liability associated with any potential for the contamination to be exacerbated by the restoration work. Although we had completed a significant amount of work covered by our contract, given the concerns expressed by the QWA and LVC regarding the potential for liability, I halted all work on the project on July 20, 2019. I notified the QWA and LVC that we would not be doing any further work until we had been notified to proceed by QWA and LVC.

- a) A Partial Resolution

In August 2019 QWA approached PADEP requesting a letter acknowledging that the groundwater contamination was a well-documented issue and relieving them of any liability related to the restoration work. After considerable deliberation DEP declined to provide a letter. The issue was partially resolved when Russ Collins, President of the Doc Fritchey Chapter Trout Unlimited (DFTU) approached the QWA and LVC proposing that DFTU would take over the project during the construction phase thereby relieving their organizations of any potential liability. As a follow-up, Clear Creeks received an email on August 22, 2019 from Michael Schroeder, Chairman of QWA indicating that the liability issue had been resolved to the satisfaction of QWA and LVC. Clear Creeks reinitiated work thereafter. The one month delay put the project behind schedule.

- b) Design Elements Incorporated to Avoid Further Impacts and Minimize Groundwater Contamination

At the time we applied for grant funding for this project I had prepared a design concept that proposed relocating the existing stream channel from its current straight alignment along the toe of the western slopes on the Weaver Property, reestablishing a channel that meandered across the middle of the

floodplain from the culvert outfall at Route 322 and tying into the existing channel downstream on the Brummel Property. This approach would have required excavating a new channel over the Mariner East Pipeline Easement. When we were made aware of the existing groundwater contamination issue, I became concerned about the potential for exacerbating the situation by having our construction contractor working over the five pipelines in the easement. Although we routinely design projects to avoid damage to public and private utilities, our concerns increased after Energy Transfer provided us with information related to the shallow depth of several of the pipelines where they cross the existing stream channel. At that point, I decided it prudent to avoid working in the pipeline easement all together. Therefore, I modified our design approach.

The final design plans show a new channel that turns into the floodplain from the culvert and returning to its current alignment prior to crossing the easement. Downstream of the easement the new channel turns again into the floodplain, returning to its current alignment prior to entering the Brummel Property. The design plans do show stabilization work along the existing channel in the easement. This work was included because the channel exhibits both streambank and streambed erosion that could potentially expose the pipelines to damage. It was our intention to obtain permits for the entire project area including the stabilization of the channel where it crosses the easement. However, our construction contractor will not perform the work over the pipelines within the easement. I proposed that this work be completed by a construction contractor working for Energy Transfer. I have been in continuous contact with them, informing them of the unstable channel conditions along their easement and providing them with a set of our design plans. They have agreed that their contractor will perform the stabilization work shown on our design plans so that our work can tie-in properly with that section of Beck Creek.

Our final design also proposes that the abandoned existing channel be backfilled at various points along much of its length. It is anticipated that the nature and extent of the backfill along the abandoned channel will function as a groundwater dam that blocks the downslope movement, forcing the shallow subsurface flow in a down-valley direction toward the gap and into the large open water wetland. The large wetland impoundment was designed to provide water quality treatment of stormwater runoff from the cultivated fields along the western slopes, as well as the shallow groundwater flowing subsurface into the wetland. The water quality treatment relies on relatively long residence time of the surface water and groundwater entering the pond, the organic soil layer that will be installed along the bottom and perimeter of the wetland and the dense growth of emergent wetland vegetation that will be planted around the shallow bench and side slopes of the wetland impoundment. Although our design objectives are focused primarily on treating agricultural runoff to reduce concentrations of sediment, nitrogen and phosphorus, it is anticipated that the wetland may also provide treatment of the petroleum aromatic hydrocarbons identified in the groundwater along the Beck Creek stream corridor. The research literature shows that constructed wetlands can be effective in the transformation, metabolism and degradation of aromatic hydrocarbons such as benzene, toluene, ethylbenzene, xylene and gasoline-range organics (M. Jain, et al, 2020; Ezio Ranieri, et al, 2015; S.D. Wallace, et al, 2011; P.E. Eke, 2008; M. Braeckevelt, et al, 2006).

c) New Headaches

Unfortunately, the contamination issue was raised again when we were in discussions with the Township about them serving as permit applicant. They requested a letter be obtained from PADEP releasing them of any liability. Russ Collins contacted Benjamin Thonus, Program Manager, Environmental Cleanup and Brownfields, PADEP, inquiring about the letter. He indicated he would follow-up with his supervisor. Unfortunately, not only was he unable to obtain the letter, but followed-up with an email indicating our construction contractor would be required to implement the following procedures during construction:

- A standard spill prevention plan when using construction vehicles in a floodplain.
- To compensate for the historic petroleum impacts, 2 downstream booming locations should be installed on the stream and monitored during construction activities.
- In addition, excavated soil should be screened with a photo ionization detector (PID) for signs of petroleum contamination.
- In the event the PID detects a strong presence of petroleum or obvious contamination is otherwise noted, construction activities must cease until the contamination is appropriately addressed.
- DEP should be contacted immediately (1-800-541-2050) in this unlikely scenario.
- Evergreen Resources Management or their agent should be contacted immediately after contacting the Department.

After coordinating with Martin Liebhardt, Evergreen Management to develop a workable solution, I sent an email to PADEP outlining our plan. PADEP approved our plan. That plan has been included in the Construction Specifications document provided to our Contractors.

2) Permit Fees

By October 2020, we were finalizing the design plans and preparing the permit applications for submission. This brought to light another problem related to the PADEP and Conservation District permit fees. The PADEP fees included a minimum \$500 for the Chapter 105 Environmental Assessment Review and \$200 for each GP4 permit required for the three proposed inlet pipes that will provide water supply for the Open Water Wetland on the Weaver Property and the Existing Pond on the Brummell Property. The Conservation District's permit fee was also \$500, resulting in a total of \$1,600 in fees. QWA did not have a budget to cover the fees.

As a result of my discussions with Karl Kerchner, Erosion and Sediment Control Supervisor with the Conservation District he agreed to reduce their fee from \$500 to \$100. Jason Shirey, our PADEP reviewer suggested having West Cornwall Township be the applicant which would eliminate the state fees. We requested that QWA approach the Township.

On December 14, 2020, Mike Schroeder and I participated in a Zoom meeting with the Township Supervisors to discuss the possibility of them functioning as applicant. A follow-up Zoom meeting was held on December 29, 2020 to present the design plans to the Public Information Committee. They indicated they would discuss the proposal and get back to us after their January meeting. Although the Township liked the project, ultimately, they had the same liability concerns as QWA and LVC.

Fortunately, the permit fee problem was resolved when DFTU agreed to be the applicant and Mr. Gardell Weaver, participating landowner agreed to pay all permit fees.

3) Bog Turtle Survey

In response to the Pennsylvania Natural Diversity Inventory (PNDI) form, we received a letter from Pennsylvania Department of Conservation and Natural Resources indicating that U.S Fish & Wildlife Service records show that the wetlands on the Weaver Property may include bog turtle habitat. USF&WS directed that a Phase 1 Bog Turtle Habitat Survey be conducted. We contacted a Bog Turtle Specialist to conduct the required survey. He quoted a \$1,200 professional fee to conduct the survey and prepare the necessary documentation of his findings. As was the case with permit fees, QWA did not have a budget to cover the survey.

The services of Robert Bull, a Bog Turtle Specialist were obtained using funds contributed by Doc Fritchey Chapter Trout Unlimited and The Lebanon Valley Conservancy. Mr. Bull conducted the survey on November 27, 2020 and found that the wetlands in the project area did not meet the criteria for bog turtle habitat. He provided his Report of Findings on December 18, 2020. The report and signed PNDI Receipt was forwarded to PADEP on December 21, 2020.

e. Solutions to Original Issues

These issues were covered in detail above.

f. Additional Efforts Planned

On May 28, 2021 we conducted a Pre-Bid Site Walk with pre-qualified construction contractors to orient them to the project and introduce them to the design plans and construction specifications. They are to provide their bids to DFTU no later than June 18, 2021. After DFTU selects the winning bidder, we will utilize their construction budget to complete the Task and Deliverable Budget Worksheet required for the construction grant application we plan to submit on June 25, 2021. If we are successful in obtaining grant funding construction of the Beck Creek 6 project will start in November 2022. It is anticipated that construction would be completed by June 2023.

g. Dissemination of Results

The Final Design Plans, Final Design Report, Construction Specifications and Permit Application Packages will be posted to the Quittapahilla Watershed Association's website. In addition, LVC and DFTU update their membership on projects via their newsletters.

h. Spending vs Budget Request

Our budgets generally do not cover the work effort required to implement a successful project. For example, in order to successfully compete for grant funding we routinely include the many hours required for the following tasks as in-kind services match:

- Preparing all grant application forms and work plans, maps, aerials and other exhibits, project description narratives, conducting preliminary site assessments, photo-documentation of existing conditions, developing concept design plans;
- Coordinating with multiple landowners, our client (LVC, QWA, DFTU, etc.) and grant staff.

If awarded grant funding we provide additional in-kind services as match:

- Providing Project Management (Tracking Project Schedule & Budget, Processing subcontractors' invoices, Preparing Team invoices for submission to LVC and DFTU);
- Coordinating and Attending Team Meetings and Site Visits;
- Coordinating with LVC/DFTU/QWA, Township and Borough staff and representatives, and County Planning staff;
- Preparing Power Presentations and Attending Community Meetings;
- Preparing Project Status Reports & Final Reports;
- Preparing OM&R Plans;
- Preparing Bid-Documents and Conducting Pre-Bid Site Showings for Contractors.

Although the work effort is the same, to remain competitive for grant funding the budgets we request are based on lower rates than typically charged for identical projects funded by municipal capital improvement programs.

2. Goals and Accomplishments Worksheets

See completed worksheets in the Appendix to this report.

3. Photographs

Existing Conditions photos of the Beck Creek 6 project area are included in the Final Design Report and Joint Permit and Chapter 105 Package on file with the SouthCentral Regional Office.

4. Detailed Technical Reports

The following documents are on file with the SouthCentral Regional Office:

- Final Design Plans (PDF)
- Final Design Report (PDF)
- Joint Permit and Chapter 105 Application Package (PDF)
- Construction Specifications (PDF)

5. Pollutant Load Reductions

The Beck Creek 6 - Stream and Floodplain Restoration Project will reduce nitrogen, phosphorus and sediment loadings from streambank erosion and agricultural runoff by more than 150.0 lbs. /yr., 136.0 lbs. /yr. and 89,760 lbs. /yr., respectively. It will restore 2,000 linear feet of in-stream habitat and riparian buffer and create 5.05 acres of palustrine emergent, scrub-shrub and forested wetlands. The estimated pollutant reductions will not be realized until after construction is completed in the Summer of 2023.

6. Operation, Maintenance, and Replacement Plans

The OM&R Plans will be developed at the end of the Construction phase of this project.