

**Quittie Nature Park Stream Restoration
Phase 1 – Construction
Scope of Work and Budget**

Project Management

1. Coordination with Client, Contractors, Permitting agencies, and Funder
 - a. Coordinate with Client on contractual issues, landowner agreements, grant application information, project scheduling, regulatory issues, etc.
 - b. Coordinate with Contractors to review and discuss design components and specifications, materials quantities and substitutions, budgets, and construction schedule, as well as permit requirements and time of year restrictions.
 - c. Coordinate with Lebanon Conservation District, Pennsylvania DEP, and U.S. Army Corps of Engineers on notification of construction commencement and completion, routine notifications of the project status, and any regulatory issues that may arise during the construction period, submission of as-built plans.
 - d. Coordination with PADEP Growing Greener Watershed Coordinator related to grant application information and timing of submission, project schedule, and final report.

2. Grant Application Preparation

Prepare Grant application form, scope of work form, task and deliverable budget worksheet, project description narrative, project schedule, etc.

3. Funder's Final Report

Prepare final funder's report including goals and accomplishments worksheet.

Construction Services

Stream Contractor

1. Mobilization/Demobilization
2. Installation of Construction Access
3. Clearing and Grubbing
4. Stake-Out
5. Temporary Stream Crossing
6. Installation of Erosion & Sediment Control Measures
 - a. Silt Fence
 - b. Daily Stabilization
 - c. Temporary Stabilization
7. Install Orange Safety Fence

8. Dam and wall Demolition
9. Stream Channel Excavation, Fill and Grading
 - a. Import Material
 - b. Export Material
10. Installation of In-Stream Structures
 - a. Log/Boulder Step-Pools
 - b. Constructed Riffles
 - c. Log/Boulder J-Hooks
 - d. Toe Wood
 - e. Cross Vane
 - f. Log Vane
11. Permanent Seeding & Mulching
12. Installation of Coir Matting

Nursery Contractor

1. Landscaping
 - a. Streambank Areas
 - i. Toe Wood Areas – Container Shrubs
 - ii. Toe Bench Areas – Live Stakes
 - iii. Top of Bank – Container Shrubs
 - b. Riparian Buffer Areas - Trees
 - c. Refugia Areas – Container Shrubs

Construction Management Services

1. On-Site Construction Supervision
 - a. During construction, provide routine on-site construction supervision of the channel restoration and installation of specific bank stabilization measures, flow diversion structures, grade control structures, habitat structures, and bank and riparian plantings.
 - b. Prepare any necessary plan modifications during construction due to unanticipated circumstances beyond the project scope.
 - c. After construction is completed, conduct a preliminary acceptance walk-through with the Contractors, the Lebanon Valley Conservancy, the Quittapahilla Watershed Association and any interested landowners and prepare a punch list outlining any outstanding work items.
 - d. Conduct a final inspection and site walk with the Contractors, the Lebanon Valley Conservancy, the Quittapahilla Watershed Association and any interested landowners.
2. As-Built Survey
 - a. Conduct an as-built post-construction survey along the Quittie Park Project reaches to the same standards as the existing conditions surveys.
 - b. Develop as-built plans of the project reaches from field run as-built survey.

Post-Construction Monitoring

After construction is completed and the site has been stabilized, general conditions along the entire project area will be photographically documented from permanently established viewpoints. The viewpoints will be recorded on the plan view sheets of the design plans.

In accordance with the state 401 Water Quality permit and federal 404 permit, the entire project area will be inspected annually for the first five years after implementation. The inspections will identify problem areas, such as bank erosion; debris accumulation; sediment deposition; and/or damage to grade control/flow diverting structures, bioengineering measures, and bank and riparian vegetation. Observations will be recorded and photographically documented.

Grade Control and Flow Diverting Structures

Visual inspections will be conducted as part of the annual inspections and following unusually high flows to evaluate the condition of grade control and flow diverting structures (e.g., cross vanes, j-hook vanes, log vanes, step-pools, etc.). Observations will be recorded and photographically documented.

The evaluation will focus on the stability and general condition of structural components. Undercutting, lateral short-circuiting or general failure of structures will be noted and photographically documented. If the visual inspections indicate substantial change has occurred, then additional survey work will be conducted to document the change and assist in determining if remedial measures will be necessary.

Bioengineering Measures

Visual inspections will be conducted as part of the annual inspection to identify problems with bioengineering bank stabilization techniques such as toe wood, toe benches, live stakes, and coir matting on banks). Evidence of tearing or deterioration in fabric; mortality in live stakes; loosening, shifting or dislodging of wood or brush in the toe wood, or boulders from the toe benches will be noted and photographically documented. If the visual inspections indicate substantial change has occurred, then additional survey work will be conducted to document the change and assist in determining if remedial measures will be necessary.

Streambank and Riparian Vegetation

Tree and shrub plantings will be evaluated annually for evidence of insect infestation, disease, weed competition, animal browsing, damage due to careless maintenance practices, and mortality. The condition of vegetation will be photographically documented.

Annual Monitoring Report

In accordance with the state 401 Water Quality permit and federal 404 permit, reports will be submitted to Pennsylvania Department of Environmental Protection and the U. S. Army Corps of Engineers every year for the first five years after implementation. The first monitoring report will be prepared during the first full growing season following construction. The reports will include a narrative describing the site conditions observed at the time of inspection. Photographs taken during the inspections will be included in the report along with the plans showing the location and orientation of the photographs. An inventory of the surviving plants will be included in the report. A written remediation plan will outline corrective actions to be taken to address any deficiencies identified during the monitoring. The reports will be submitted to PADEP and the USACOE for review and approval prior to December 31 of each monitoring year.

Contractor's Budget

Task	Contractual	Matching	Contractor
Contractual Services			
Project Management Coordination with Client, Contractors, Permitting agencies, and Funder Grant Application Preparation Final Report Preparation		\$8,000.00 \$5,000.00 \$5,000.00	Clear Creeks Consulting LLC Clear Creeks Consulting LLC Clear Creeks Consulting LLC
Construction (Mobilization/demobilization, clearing & grubbing, channel excavation, installation of in-stream structures, sediment control) Seeding and installation of plant materials Subtotal, Construction	\$342,633.00 \$37,136.00 \$379,769.00	\$11,000.00 \$4,500.00	Aquatic Resource Restoration Co. Sylva Native Nursery
Construction Administration Construction Management As-Built Survey Subtotal, Construction Administration	\$27,825.00 \$5,500.00 \$33,325.00		Clear Creeks Consulting LLC Aquatic Resource Restoration Co.
Post-Construction Monitoring Annually for 5 years Post-Construction Habitat Assessment	\$25,000.00	\$5,000.00 \$10,000.00	Clear Creeks Consulting LLC (C) PA Fish & Boat Commission (M)
Total Contractor Budget	\$438,094.00	\$45,500.00	
Project Administration 5% of Grant Request	\$21,904.70	\$10,000.00	Lebanon Valley Conservancy Quittapahilla Watershed Association
Total	\$459,998.70	\$58,500.00 (12.7%)	