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Kevin L. Reichard, PE  
BioMost, Inc.

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Date

## **TECHNICAL SPECIFICATIONS**

### **SCOPE OF PROJECT**

The intent of this project is to modify an existing, passive, acid mine drainage treatment system at an old coal mine in accordance with the Drawings and these Technical Specifications.

The work involved essentially consists of:

limited excavation to locate, clean, and install PVC pipe sections, valves, and fittings on existing inlet and outlet piping for an existing passive treatment system; placement of compacted clay material in areas excavated for system modifications; limited excavation and reworking of existing limestone aggregate treatment medium in existing Horizontal Flow Limestone Bed; furnish and install baffle curtain in existing Horizontal Flow Limestone Bed; repair existing 40-mil HDPE liner in areas compromised during implementation of modifications; maintain and improve, as needed, existing dirt access roads; stabilize and revegetate areas disturbed during project implementation.

Directions to the project area are:

From Osceola Mills

At the intersection of Stone Street and Curtin Street (PA SR0053 & SR0970) continue southeast on Stone Street/PA SR0053 about 0.1 miles; bear right onto Sarah Street and continue on PA SR0053 about 1.5 miles; turn left onto access road (at sign for Leslie Tipple). Follow access road about 1.2 miles, bear left at "Y" intersection and follow dirt road down hill away from coal processing facility. Cross over Moshannon Creek and a railroad grade. About 1000 feet south of the Moshannon Creek crossing at the intersection of a dirt access road, turn right. Travel westerly about 1200 feet to the passive treatment system at the Power Lake site along and east of the railroad grade.

## **MEASUREMENT AND PAYMENT**

Payment will be made at the established contract lump sum price.

Invoices may be submitted monthly to the Department based on approximate percentage of project completion.

Payments shall be based on satisfactory completion of the following items, unless otherwise approved by the Department's Representative:

- 5% Mobilization (50% of Mobilization & Demobilization)
- 15% Erosion & Sedimentation Control and Water Handling
- 10% Pipe Cleaning & Intake Pipe Modification
- 40% Excavating and Grading & HDPE Liner Cut and Repair
- 5% Baffle Curtain, VFP Drain Valve Replacement
- 10% Revegetation
- 5% Demobilization & Site Cleanup
- 10% Final Project Acceptance

Other required items completed shall be considered as part of the above listed items or shall be considered incidental.

Ten percent (10%) of the total contract lump sum price bid shall be withheld until final project acceptance by the Department. Final project acceptance includes completion of all contract items, including removal of all equipment and satisfactory completion of cleanup operations. Flow through all components of the passive treatment system shall also be documented, including the final system discharge from the HFLB. If needed to demonstrate flow through the system, water shall be temporarily pumped from Power Lake to the VFP. The new VFP drain valve shall also be determined to be operational by fully opening and fully closing. The valve installation shall not be approved if leakage is observed in the closed position.

Documentation of all project work is required and shall include digital progress photographs displaying the time and date stamp on the recorded image. Photographs are to be taken DAILY whenever activities are conducted onsite by the Contractor or his agents to provide a detailed log of project work. All photographs shall be submitted to the Department's Representative. Form and frequency of submission shall be as approved by the Department's Representative.

Receipts for material delivered to the site shall include date and time of delivery, identification of quantity and type of material delivered with name and contact information (including mailing address) of the responsible party delivering the materials.

## **DETAILED SPECIFICATIONS FOR MATERIALS**

### HDPE Liner Repairs

- The existing 40-mil HDPE liner in the VFP and HFLB shall be repaired, where compromised during project work using a 40-mil HDPE patch fastened to the existing liner using Fabrication Tape and Seam (Pressure Sensitive) Tape. Other methods of repair may be used upon approval by the Department's Representative.

### Valve

- The VFP replacement drain valve shall be a slide gate-type valve manufactured by Valterra Products, Inc., Mission Hills, CA for use with 8", SCH40, PVC pipe as specified on the Drawings. An alternative valve may be used upon approval by the Department's Representative.

### Pipe

- Schedule 40 and Schedule 80 PVC pipe and fittings shall conform to ASTM D1784 or D4396. Pipe shall conform to ASTM D1785 (pressure) or D2665 (drain, waste, vent) or F891 (drain, waste, vent) with fittings conforming to ASTM D2466 (pressure) or D2665 (drain, waste, vent). All PVC pipe shall be unperforated, solid or foam core. Pipe Cement and Cleaner for solvent welds shall conform to ASTM D2564 and ASTM F656. Flexible couplings shall conform to ASTM D5926.

### Baffle Curtain

- Baffle material shall be UV-stabilized vinyl laminate material (brattice cloth). Curtain and weights to be fastened using UV-stabilized, commercially-available, nylon rope. Weights shall be commercially-available bricks with holes to readily accept rope. Steel stakes shall be 3/4" diameter steel reinforcing bar.

### Seeding

- Temporary and Permanent seeding shall be performed in accordance with the details included on the Drawings.
- Mulching and soil amendment requirements are shown on the Drawings. For consideration of revision to the type and rate of application for soil amendments, the Contractor shall submit soil samples to an approved lab for analysis. All analyses shall be submitted to the Department's Representative. At the discretion of the Department's Representative, the type of amendments and rate of application may be revised based on the soil analyses.

## **OPERATION SPECIFICATIONS**

### **OPERATION SPEC. #1 - MOBILIZATION AND DEMOBILIZATION**

#### 1.1 SCOPE

The work consists of: contacting PA One-Call prior to mobilization and prior to any earth disturbance; improving, as necessary, access roads used by the Contractor for mobilization/demobilization; delivery to the project site and preparation/assembly of all plant, equipment, materials, and supplies; removal of all such furnishings; and cleanup of disturbed areas upon project completion.

#### 1.2 PROCEDURE

##### A. Mobilization

This work includes compliance with all local, state, and federal laws and regulations in reference to delivery and assembly of all plant and equipment required to complete the Contract and the storage of all materials and supplies. Plant shall include storage areas, and sanitary or other required facilities. Prior to commencement of any work, the Contractor's plant and equipment shall be in proper working order and shall be subject to the approval of the Department's Representative.

The work also includes improving any access roads, as necessary, for adequate access of equipment, materials, and personnel.

**The Contractor shall contact the PENNSYLVANIA ONE-CALL SYSTEM prior to mobilization and not less than three (3) working days prior to any improvement to the access roads or any excavation or construction activities.** The PA One-Call request shall include all private access roads to be utilized by the Contractor. The Contractor shall also contact all utilities listed on the Drawings. During the design phase, PA One-Call was notified on 02/25/08 (Serial Number 0496238).

The work also includes obtaining the required permits, insurance, bonds, and any other initial items required for the start of work.

##### B. Demobilization

The work refers to the removal of all plant and equipment from the project site upon project completion.

The work also includes cleanup and restoration of all work areas or any other areas disturbed as a result of the project. The Contractor shall be required to restore any disturbed areas to a condition equal to or better than that which existed prior to the work being done, such as repairing or replacing any improvement to the land, including but not limited to: access roads used as part of the project, gates, driveways, structures, fences, walls, culverts, channels, landscaping, and other similar items which may have been removed by or damaged by or as a result of the work.

## OPERATION SPEC. #2 - EROSION & SEDIMENT CONTROL AND WATER HANDLING

### 2.1 SCOPE

The work consists of furnishing all plant, labor, equipment, and materials and of performing all operations in connection with the installation and maintenance of all temporary erosion and sediment pollution (E&S) controls as shown on the applicable Drawings as well as water handling during construction. Work includes controlling and directing flow through the system and prompt permanent revegetation of affected areas. In the event of deviation from the requirements provided in the E&S plan, which includes modifications, additions, and deletions, the subsequent revisions will require approval of the Department's Representative.

### 2.2 PROCEDURE

- A. General. The Contractor shall follow the construction and erosion control sequence shown on the Drawings.
- B. Water Handling. Mine drainage enters the passive treatment system from an extensive settling pond area known as Power Lake (a.k.a. Swamp Pond #1) through an 8" intake pipe equipped with a tee and two outlets controlled by butterfly-type valves (inlet pipes). One inlet pipe discharges to the VFP and the second to the HFLB. During low-flow (dry) periods, the water elevation in Power Lake may not reach the invert of the intake pipe. During high-flow (wet) periods, water enters the intake pipe and is conveyed to the VFP and/or HFLB, depending on the position of the inlet control valves. The existing treatment system components are located in a reported "discharge zone" with significant shallow groundwater. (The VFP, HFLB, SP1 and SP2 liners are designed to exclude unwanted groundwater as well as retain drainage entering through the inlet pipes.)

During system modification, both inlet control valves are to be set to the shut position. The VFP drain valve is to be subsequently opened and the VFP completely drained during construction. Improvements to the intake pipe (Power Lake primary spillway) should be conducted prior to pumping to Power Lake. Water from the VFP, HFLB and/or SP2 shall be pumped, as needed, to Power Lake to facilitate the improvements to the VFP and HFLP. Water encountered during excavation of the trench needed to install the VFP outlet pipe shall be pumped to Power Lake if needed. The water level in Power Lake may be allowed to rise above the inlet pipe and discharge via the emergency spillway if conditions warrant. Any water pumped to Power Lake should be discharged in a manner to avoid sediment build-up in the intake pool area or discharge of sediment through the emergency spillway.

Upon completion of system modifications the VFP drain valve is to be shut and the VFP inlet control valve opened. The HFLB inlet control valve is to remain in the shut position.

## OPERATION SPEC. #3 – PIPE CLEANING & INTAKE PIPE MODIFICATIONS

### 3.1 SCOPE

The work consists of furnishing all plant, labor, equipment, and materials and of performing all operations in connection with inspection and cleaning of existing pipes and modifying the intake pipe as shown on the Drawings.

### 3.2 PROCEDURE

- A. Pipe Inspection. The existing condition of all pipes noted to be cleaned on the Drawings shall be inspected by visual or physical methods. Visual inspection methods include opening all valves and/or removal of all fittings needed to project light into the pipe as needed to document that the pipe is open and “free-flow” conditions are present (>90% of inside diameter of pipe is unobstructed by sediment or debris). Physical inspection methods include directing water into the pipe to achieve “full-flow” conditions (i.e. outlet of pipe is >90% filled). The condition of the pipe inspected by either method is to be confirmed by the Department’s Representative by direct inspection or approval of adequate progress photographs. If the Department’s Representative determines that the “free” or “full” flow conditions are not present, the pipe shall be cleaned.
- B. Pipe Cleaning. Where pipe cleaning is determined by the Department’s Representative as necessary, the pipe shall be cleaned using a mechanical-type pipe cleaning device (i.e. power snake, sewer “jetter” or approved equivalent) with a manufacturer’s rating for at least an 8” diameter pipe.
- C. Intake/Inlet Pipe Modifications. The existing 8” SCH80 PVC intake pipe shall be cut as needed and the fittings installed in accordance with the Drawings. The new Tee will be glued to the existing 8” pipe, but the riser and cap shall not be glued to the tee. Holes shall be drilled at the locations and sizes specified on the drawings.

The VFP inlet pipe shall be modified by installing the VFP inlet control device in accordance with the Drawings. All hub-type fittings shall be glued in accordance with manufacturer’s recommendations. Threaded fittings shall be hand-tightened without the use of tools to allow easy future removal. Holes shall be drilled at the locations and sizes specified on the drawings.

## OPERATION SPEC. #4 - EXCAVATION AND GRADING

### 4.1 SCOPE

The work consists of performing all excavation to the lines and grades shown on the Drawings. The work includes all required excavation for the VFP underdrain tie-in, installation of the VFP outlet pipe, reconfiguration of the HFLB, excavation of the intake pool, and other features shown on the drawings. The work shall include segregation and stockpiling of selected onsite material encountered during required excavation including: compost and limestone in the VFP, and clay material for use in backfilling the trench needed to install the VFP outlet pipe. The work also includes all operations necessary to remove and to dispose of any other materials that may be

encountered during HFLB reconfiguration including topsoil or organic material in the Excess Fill Placement Area shown on the Drawings.

The work also includes the requirement that the Contractor keep water, including surface water, subsurface (groundwater) water, and seepages out of the work area until after completion of the facilities.

## 4.2 PROCEDURE

- A. General Excavation and Grading. All excavation is unclassified and all material encountered, regardless of character, shall be removed to the lines and grades shown on the Drawings. Excavation of bedrock or similar strata that, in the opinion of the Department's Representative, requires blasting is not intended. If these conditions are encountered, the Contractor shall obtain from the Department's Representative, grade modifications necessary to avoid such operations. The Contractor shall not be separately compensated for ripping and/or blasting.

Any erosion gullies formed as a result of the Contractor's activities shall be backfilled to the adjacent ground elevation and compacted by making the maximum practical use of available hauling and spreading equipment. The final grade shall be approved by the Department's Representative before performing subsequent operations.

- B. Clay Material for Trench Backfill. The trench described in Specification 4.2.B shall be backfilled with clay material. The clay material shall be free from stones over ¼" inch in any dimension. If clay material is encountered during required excavation of the VFP outlet pipe trench, the material shall be stockpiled separately or used immediately as backfill. The clay material shall be dried, as needed, prior to placement. Based on cursory field inspections of surface conditions, it is anticipated that a separate borrow pit will be needed as a source of clay material. Onsite sources may be identified by the contractor and approved by the Department's Representative. Offsite sources will also be acceptable. Clay material shall be visually inspected and approved by the Department's Representative prior to placement.

- C. Trench Excavation for VFP Outlet Pipe and Backfill with Clay Material. The liners in the VFP and HFLB shall be cut and folded in accordance with Specification 5.2. A trench shall then be excavated to the elevation shown on the plans. The trench excavation shall extend a 0.5' below the proposed pipe invert elevation. The excavation shall not have vertical walls in excess of 4' high. The trench walls shall be excavated to a 1 Horizontal : 1 Vertical grade or flatter as needed above a maximum 4' vertical wall height or otherwise graded and/or shored as needed to meet all applicable OSHA requirements. The minimum width of the trench shall be 2.0' to allow for compaction of fill material around the haunches of the proposed pipe.

Prior to placement of the clay material, the bottom of the trench shall be carefully and evenly compacted using the pressure of a bucket attached to a hydraulic excavator or other similar equipment and/or compacted with hand-directed powered equipment (vibratory plate compactor, vibratory rammer, etc.) A minimum of 0.5' (compacted thickness) of clay material is to be placed and compacted in accordance with Specification 4.2.D on the

trench bottom. The clay material is to be placed and graded as needed to provide a uniform surface for pipe placement at the elevation specified on the Drawings.

The VFP outlet pipe shall be placed on the 0.5' layer of clay. Clay material shall be placed and worked around the haunches of the pipe by hand and compacted in accordance with Specification 4.2.D. Clay material will continue to be placed and compacted to completely backfill the trench.

- D. Compaction. Compaction shall be accomplished by routing appropriate equipment so that all parts of each layer are equally compacted. If sheepsfoot rollers are to be used, the thickness of each layer of fill (lift thickness) prior to compaction shall be not greater than 8" and at least 3 passes are required. When rubber-tired compaction equipment is to be used, the thickness of each layer of fill prior to compaction shall be no greater than 6" and at least 5 passes are required. When track-type compaction equipment is to be used, the thickness of each layer of fill prior to compaction shall be not greater than 4" and at least 3 passes are required.

Crawler-type tractors used for compaction shall exert a unit tread pressure of not less than 5 pounds per square inch, and shall not be operated at a speed exceeding 3.5 miles per hour.

At the option of the Department's Representative, acceptance of completed lifts may be based upon non-movement of compaction equipment operating on the lift surface.

The Contractor shall provide hand or manually directed compaction in areas of pipe placement and at any confined area not accessible to normal equipment. Fill within 2' of pipe shall be placed in layers not thicker than 4" and compacted by hand tamping or by using manually directed power rammers (tamper) or plate vibrators.

- E. Existing Liner Protection. Equipment shall enter the VFP and HFLB in such a manner to prevent damage to the existing HDPE Liners. Onsite earth material free from objects >1" in any dimension shall be placed to minimum thickness of 1 foot on the liners as needed to a width sufficient to allow equipment access. Other methods of liner protection may be considered, as approved by the Department's Representative.

The layer of earth material shall be maintained as needed during construction to prevent damage to the liners. Limited earth material shall be allowed to extend onto the treatment media in both the VFP and HFLB to facilitate movement of equipment into and out of the pond structures. The placement of earth material on the treatment media shall not be excessive and shall be subject to approval of the Department's Representative. Earth material placed to facilitate equipment access to the VFP and HFLB shall be left to facilitate future maintenance activities.

Any liner damage caused by the Contractor while entering or exiting or while performing work within or around the VFP and HFLB shall be immediately repaired in accordance with Specification 5.2.B.

- F. Vertical Flow Pond Underdrain Tie-In. Equipment shall enter the VFP in accordance with Specification 4.2.E. The compost layer shall be carefully excavated and stockpiled

separately within the VFP. The limestone layer shall be carefully excavated and stockpiled separately. The limestone shall be removed to expose the perforated underdrain lateral and solid header pipe and allow the work necessary to install the pipe and fittings as shown on the Drawings. Any pipe damaged during excavation shall be documented with Progress Photographs and reported to the Department's Representative and shall be repaired immediately with compatible materials and fittings (rigid SCH40 PVC, flexible couplings, etc.). The existing connection of the southernmost lateral at the solid header pipe shall be located. The existing fitting (assumed to be a 90° elbow) shall be removed. The existing perforated lateral and header pipe shall be cut as needed to facilitate installation of the proposed tee. Rigid PVC or flexible rubber (Fernco-type) couplers and short stubs of 8" SCH40 PVC pipe shall be used as needed.

Prior to replacing the limestone and compost, all pipe and fittings as shown on the Drawings shall be installed, the VFP outlet pipe trench backfilled and liner repaired. The limestone shall then be carefully placed on the VFP bottom and around the pipes to prevent damage to the liner and pipes. Any liner or pipe damage shall be repaired immediately. Limestone shall be evenly placed to the elevation shown on the Drawings. The compost shall be replaced and evenly and uniformly spread. Any compost or limestone disturbed in the VFP shall be replaced to equal to or better than preconstruction conditions.

- G. Horizontal Flow Limestone Bed Reconfiguration. Equipment shall enter the HFLB in accordance with Specification 4.2.E. The inlet and outlet pools shall be excavated to the dimensions, elevations and lines shown on the Drawings. Any non-limestone aggregate material encountered (i.e. topsoil, organic matter, etc.) shall be removed, placed and spread in the Excess Material Placement Area.

Existing baffles #1 and #2 will be removed as they are encountered, if needed baffles #1 and #2 shall be cut to avoid damaging the HDPE pond liner. Baffles #3 through #5 are to be left in place and repair of these baffles is not needed if damaged during excavation work.

A layer of limestone up to about 6" thick may be left on the bottom and sides to help avoid damaging the HDPE liner.

- H. Intake Pool Excavation. A pool shall be excavated around the 8" intake pipe in Power Lake to help prevent sediment from entering the VFP. The pool shall be excavated to the dimensions shown on the drawings. Material removed during pool excavation may be placed and spread in Power Lake above the 1484 contour.

## OPERATION SPEC. #5 – HDPE LINER CUT AND REPAIR

### 5.1 SCOPE

The work consists of furnishing all plant, labor, equipment, and materials and of performing all operations to cut, temporarily fold-back, replace and repair the 40-mil HDPE liner where the new VFP outlet is to be installed as well as repair any inadvertent damage to the HDPE liner that may be caused during construction.

## 5.2 PROCEDURE

- A. Cutting & Temporary Folding of HDPE Liner. The existing 40-mil HPDE liner shall be exposed by carefully removing overlying material as needed to facilitate cutting and folding back to facilitate VFP outlet pipe installation. A single cut shall be made from the top of the liner directly above the location of the proposed VFP outlet pipe. The cut shall extend below the proposed pipe elevation only to the extent needed to facilitate pipe installation. The liner may be cut around proposed pipe as needed. It is assumed that the existing liner is secured near the top of the VFP and HFLB embankments in a key trench. The assumed key trench will be carefully excavated as needed to allow liner to be folded back to allow installation of the VFP outlet pipe.
- B. 40-Mil HDPE Tape-Type Patch with Prefabricated Boot. After the VFP outlet pipe is installed and the trench completely backfilled, a tape-type HDPE patch with prefabricated boot shall be installed. The patch shall extend a minimum of two feet from the cut in all directions except the top located within the key trench. The patch dimensions shall be field verified based on the actual length of cut to insure the proposed dimensions shall be met (e.g. the dimensions shown on the Drawings are representative). The patch shall be ordered from a commercial manufacturer (i.e. Landsaver Environmental, etc.) and include a prefabricated boot to allow penetration of the 8" SCH40 PVC pipe. The angle of the boot shall be fabricated so that a level 8" SCH40 PVC pipe may enter the pond with 2H:1V inside slopes. The boot shall be secured to the pipe with a stainless steel hose clamp.

The patch shall be fastened with a double row of Fabrication Tape between the patch and existing liner and the edge of the patch shall be secured with Seam (Pressure Sensitive) tape in accordance with the Drawings and the manufacturer's specifications.

Prior to patch installation, the existing liner to receive the patch shall be laid flat and smooth and be free of folds or ripples and not pulled tight. The surfaces to receive the tape should be clean and dry. Dirty or wet surfaces should be completely cleaned with water, paper towels, dry rags or other materials that will prepare the surface for the tape. Accumulations of dust should also be removed to insure a securely sealed seam.

Both Fabrication and Seam tape obtain their optimum adhesion when the surfaces to be bonded are warm. The surfaces should be at least 60° F to insure an acceptable bond. In order to obtain a bond at lower temperatures, external heat may be required. The use of an industrial style hot air blower is one recommended method. Extra care should be taken when attempting to place the Fabrication tape at temperatures below 32° F.

The Fabrication tape should be placed approximately 1 foot from the cut. The tape should be applied as straight and uniformly as possible. The tape should be allowed to follow the contours of the existing liner and not be stretched tight. Once the first row of tape is installed, place a second row of tape approximately 2" away from the first row on the side further from the cut and insure that the second row be approximately 2" from the edge of the patch.

After the second row of Fabrication tape has been installed, the release paper should be removed from both rows of tape and the patch secured to the existing liner. Do not pull the

patch tight during the securing process to avoid future potential wrinkles. All voids or wrinkles, if they do exist, should be sealed with Fabrication tape.

Once the patch has been secured to the existing liner, the exposed edge of the panel is to be secured using Seam tape. Insure that the liner and patch are clean and dry prior to application of Seam tape. Press Seam tape into place to insure secure adhesion. Inspect all seams and reseal and/or replace tape that has become contaminated from dirt or other foreign substances.

- C. Other Liner Repairs. Any other liner damage that occurs during construction shall be repaired in accordance with Specification 5.2.B and the manufacturer's specifications. The minimum liner patch size shall be 4' x 4' to allow 2' overlap in all directions from any puncture or damaged area. All repair patches must extend a minimum of 2' from any puncture, tear, or other damaged area. Any liner repairs resulting from contractor activities shall be the responsibility of the contractor and considered incidental to the project work.

#### OPERATION SPEC. #6 – BAFFLE CURTAIN

##### 6.1 SCOPE

The work consists of furnishing all plant, labor, equipment, and materials and of performing all operations to install a windowed baffle curtain in accordance with the Drawings.

##### 6.2 PROCEDURE

- A. Baffle Curtain. After reconfiguring the HFLB, a baffle curtain is to be installed in accordance with the Drawings. The curtain is to be constructed using UV-stabilized vinyl laminate material (brattice cloth) or other similar heavy-duty, commercially-available, material as approved by the Department's Representative.

The curtain is to have windows cut into the baffle at the size and locations shown on the Drawings. The curtain is to be equipped with the floatation mechanism shown on the Drawings or other sufficient material to ensure buoyancy and the top of the curtain is to extend at least 2" above the surface of the water. The bottom of the curtain shall be weighted with corrosion-resistant material in such a manner so that the bottom of the curtain is extended vertically below the top of the curtain. The bottom of the curtain is not to touch the bottom of the HFLB and a minimum 1' gap shall exist between the bottom of the HFLB and the bottom of the curtain.

#### OPERATION SPEC. #7 – VFP DRAIN VALVE REPLACEMENT

##### 7.1 SCOPE

The work consists of furnishing all plant, labor, equipment, and materials and of performing all operations to remove a broken 8" PVC butterfly valve and install a new 8" slide gate-type Valterra valve.

## 7.2 PROCEDURE

- A. VFP Drain Valve Replacement. Remove the cast iron manhole cover and pump water from manhole as needed. Open the existing 8" PVC butterfly valve and allow the VFP to drain. Carefully cut the existing 8" SCH80 PVC pipe on either side of the existing valve and remove the valve. Glue short pieces (stubs) of SCH40 or SCH80 PVC pipe to both sides of the new 8" Valterra valve. Stubs shall extend from the new valve a length sufficient to be fully inserted into new couplings connected to the existing PVC pipe. The valve with stubs shall be connected to the existing PVC pipe using either SCH40 or SCH80 rigid PVC or flexible (Fernco) couplings. The valve handle shall extend vertically upward from the valve. All new connections and the new valve shall be free of any leaks and the valve should open and close easily.

## OPERATION SPEC. #8 - REVEGETATION

### 8.1 SCOPE

The work consists of furnishing all labor, equipment, and materials and performing all operations in connection with select grading and establishing permanent revegetation on any areas disturbed while making improvements to the existing passive treatment system including any earthen embankments and cut slopes of the passive treatment system, the Excess Material Placement Area, any onsite clay material sources and other areas disturbed during construction.

### 8.2 PROCEDURE

- A. Select Grading/Seedbed Preparation. Grade Excess Material Placement Area to conform with the surrounding topography as needed. Grade all areas disturbed during construction to equal to or better than pre-construction conditions as needed.
- B. Seeding. On all surfaces to be seeded, sticks, rocks, weeds, roots, or other objectionable material appearing on the surface which, in the opinion of the Department's Representative is detrimental to obtaining a satisfactory stand of vegetation, shall be removed. Lime and fertilizer shall be applied evenly on all areas to be seeded. Immediately prior to sowing seed, the soil shall be scarified to an approximate depth of about ¾". All scarifying shall be done in a direction parallel to the contour lines on the slope and not uphill or downhill. The grass seed mixture shall be sown on a still day at the rate per acre specified. For conventional seeding applications, the seed shall be sown either by hand or by approved sowing equipment in two applications, one half while the seeder is traveling in one direction and the other half while traveling at right angles to the first direction. Within 48 hours after sowing has been completed, mulch shall be uniformly applied over the entire surface at the average rate specified and spread to a uniform depth.