

**Director's Report**  
**April 12, 2018**

**Melanie D. Davenport**  
**Director, Water Permitting Division**

# **Mountain Valley Pipeline, LLC**

**Erosion and Sediment Control  
and  
Stormwater Management**

# ESC and Stormwater Management Plan Review Time Line

Spring 2016 – Summer 2017

- Meetings with MVP on Virginia's ESC and SWM requirements
- Review by DEQ of proposed project documentation related to Annual Standards & Specifications and ESC and SWM plans
- AS&S approved June 20, 2017

# ESC and Stormwater Management Plan Review Time Line

Summer 2017 – March 26, 2018

- DEQ hires 3e Consulting, Inc. June 2017 to assist in MVP and ACP plan review
- 100+ ESC and SWM plan sets received for ROW, roads, contractor yards, and white paper
- More than 4,500 hours of 3e and 2,000 hours of DEQ staff time spent on plan review
- March 26, 2018 DEQ determines ESC and SWM plans for MVP meet regulatory requirements and approves plans for 4 spreads, 2 contractor yards, and access roads

# Annual Standards & Specifications

- § 62.1-44.15:31 of VA Code requires gas pipelines to obtain Annual Standards and Specifications consistent with:
  - Stormwater Management Act and associated regulations
  - Erosion and Sediment Control Law and associated regulations and
  - Regulations governing the General Virginia Stormwater Management Program (VSMP) Permit for Discharges of Stormwater from Construction Activities (the construction general permit)
- AS&S generally describes programs for:
  - performing plan reviews
  - conducting compliance inspections
  - details requirements of the SWPPP
  - Other special environmental consideration (such as karst mitigation plan)

# Site Specific Plans

- 9VAC25-870-76 of VSMP regulations requires site-specific stormwater management plans or comprehensive stormwater management plan for post construction SWM from linear development projects.
- Site specific plans required regardless of AS&S
  - Detail features specifically located at project site
  - Demonstrate implementation of ESC and post construction SWM measures
  - Identifies components required for complete ESC and SWM plans

# Plan Review Process: Completeness Review

- General project information
- All detail sheets for project
- Supporting calculations
- Existing and proposed topography
- Limits of disturbance delineated
- Temporary and permanent ROW
- Jurisdictional waterbodies and impaired waters
- Stream crossings
- Pre- and post- land cover and predominant soils (for SWM)
- Environmentally sensitive features, applicable setbacks
- ESC measures
- SWM facilities (if applicable)
- Existing and final drainage patterns and flow paths
- Final stabilization and revitalization plans
- General calculation principles correctly applied

*Full ESC and SWM plan review begins after plans are deemed “complete”*

# Plan Review Process: Full Review

- Verify plans accurately represent existing conditions
- Determine appropriateness of ESC and SWM measures and placement
- Confirm all calculations meet ESC and SWM requirements.

*ESC and SWM plans cannot be approved until reviewed by a certified plan reviewer.*

*§62.1-44.15:53 A and §62.1-44.15:30 B*

# Strategic Approach to Plan Review

- Initially received plans for all spreads
- Implemented a ‘template’ approach: review and comment on a single spread, once satisfactorily meets all Virginia’s ESC and SWM requirements, apply all methodologies to all other spreads.
- More efficient
- Spread 8 chosen as the template
  - Represents various environmentally sensitive features found across multiple spreads

# Typical Utility Erosion and Sediment Control (ESC) Measures

TYPICAL ESC MEASURES	DEFINITION
Waterbars/Slope Breakers	Is a ridge or channel constructed diagonally across a utility right-of-way or a road that is for the water to be conveyed off the construction site. They break the flow into smaller volumes to help control the velocity of the water coming off of the site.
Compost Filter Sock (CFS)	Is a type of contained compost filter berm with a mesh tube filled with composted material that is placed perpendicular to sheet-flow runoff to control erosion and retain sediment in a disturbed areas.
Silt Fence,	Is a fence made of filter fabric material used on construction sites to protect water quality in water bodies from sediment latent stormwater runoff.
Belted Silt Retention Fence (BSRF)	Is a silt fence that has greater elasticity providing more protection to help with filtering capabilities and enhanced structural strength.

# Typical Utility Erosion and Sediment Control (ESC) Measures

TYPICAL ESC MEASURES	DEFINITION
Super silt fence (chain link backed)	Is a design that uses filter fabric reinforced by a wire mesh or chain link fence. The metal backing gives the fence increased strength to resist the weight of soil and water, which may be trapped by the fence in a large drainage area.
Sediment sump/trap/basin	Is a temporary pond built on a construction site to capture eroded or disturbed soil that is washed off during a storm. It allows for the water to settle in this area before discharging into a local water body.
Sediment sump/trap/basin	Is a diversionary measure that conveys water away from a project area towards other ESC control measures. These diversion dikes are used to allow for proper sizing of downstream ESC measures.
Clean Water Diversions	Is a diversion measure that moves clean water that is outside of the project area away from entering the construction site. This may be done by utilizing a dike or a pipe or both in conjunction with one another.

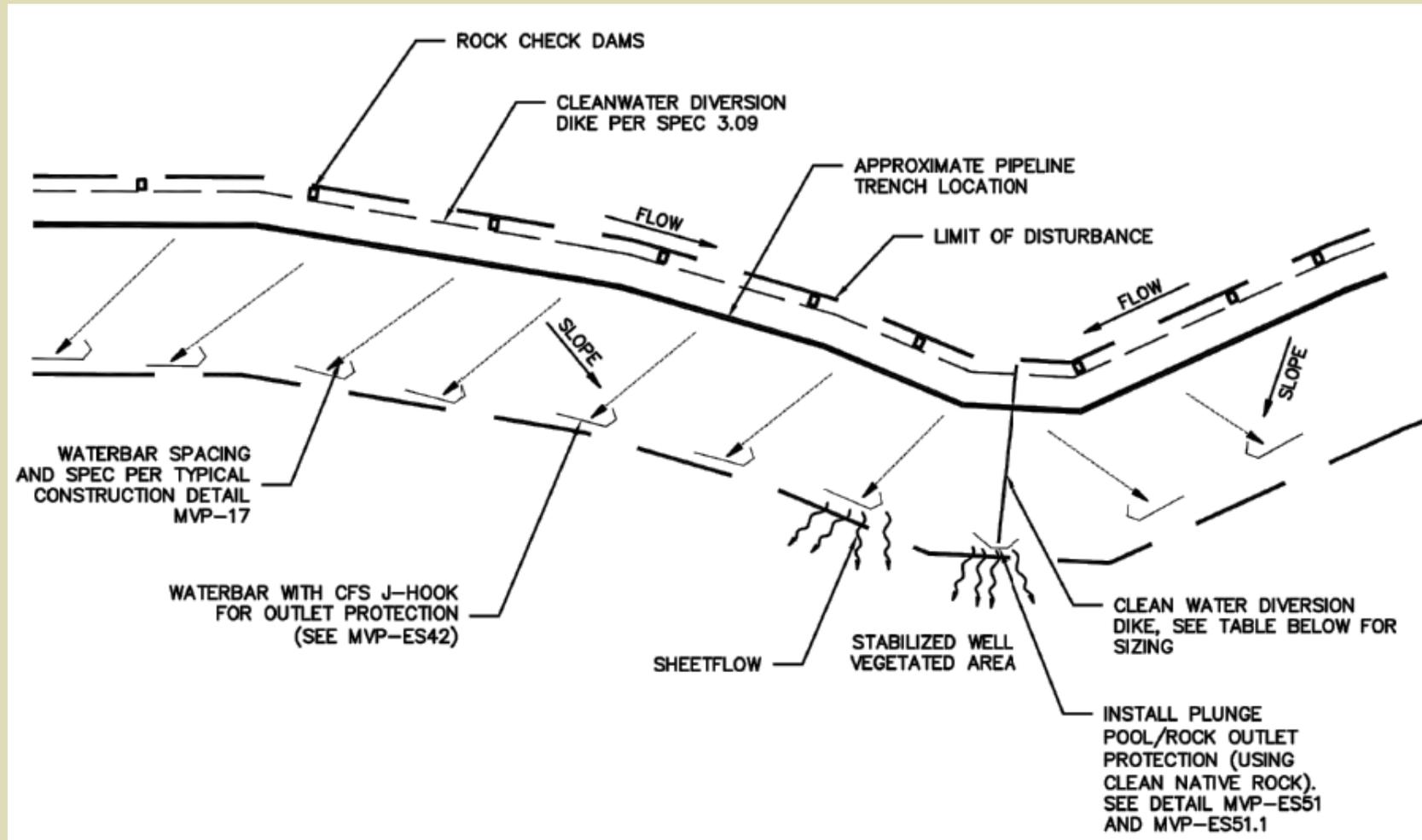
# Typical Utility Erosion and Sediment Control (ESC) Measures

TYPICAL ESC MEASURES	DEFINITION
Slope Drains	Is a pipe that leads water away from the right of way or outside the construction site. This flow may be clean or have sediment within it.
Outlet Protection	Is typically riprap (rock) that is used as slope protection to prevent erosion by dissipating the energy of the runoff. This is done by reducing the speed of concentrated stormwater flow, thereby reducing the potential of erosion or scouring at stormwater outlets.
Trench Breakers	Are used in pipeline construction to control erosion and are usually placed at a specified distance down slope in series of one another. They are typically made of Polyurethane Foam and/or Sandbags which helps to keep water from running down the trench.
Wetland Crossing Mats	Is a hardwood mat or logs cabled together that prevent heavy equipment and vehicles from impacting areas, sometimes it is used as part of a bridging or causeway system.
Post Construction Mats used to Encourage Vegetation for Stabilization	Is either a jute mesh mat, hydro seeding tackifiers, or some other stabilization method that limits the movement of exposed soils and encourages both temporary and permanent vegetation to establish within the post construction site.

# Clean Water Diversion (CWD)

- Used to divert water from running onto project area
- Unique to Virginia
- Allows proper sizing of each individual ESC measure to provide reasonable assurance that the system as a whole will minimize erosion and sedimentation
- 1,058 clean water diversions proposed

# Temporary Construction Clean Water Diversion Detail



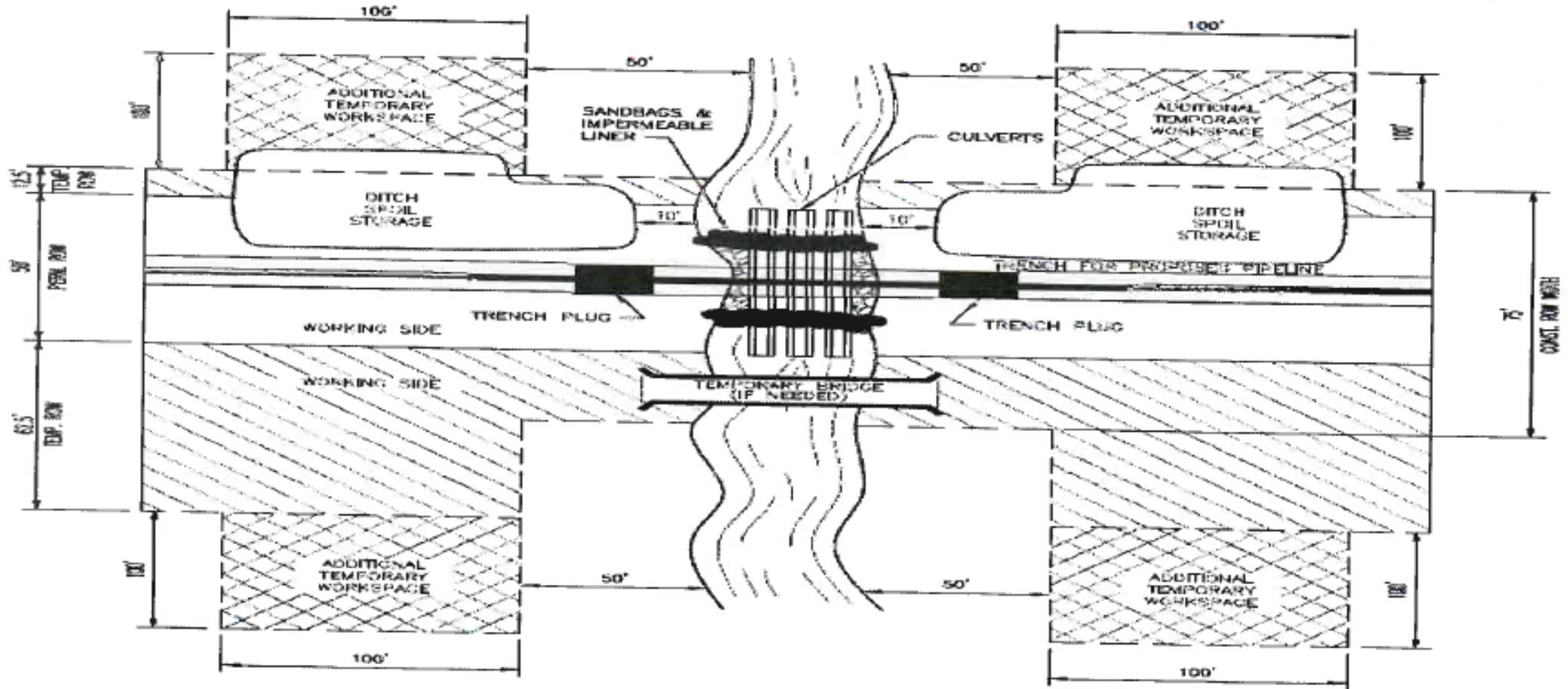
# Waterbars

- Required by FERC
- Temporary and permanent
- Approximately 3,800 total
- Potential to create a point of concentrated flow at permanent waterbars, which could cause erosion
- MVP revised approach

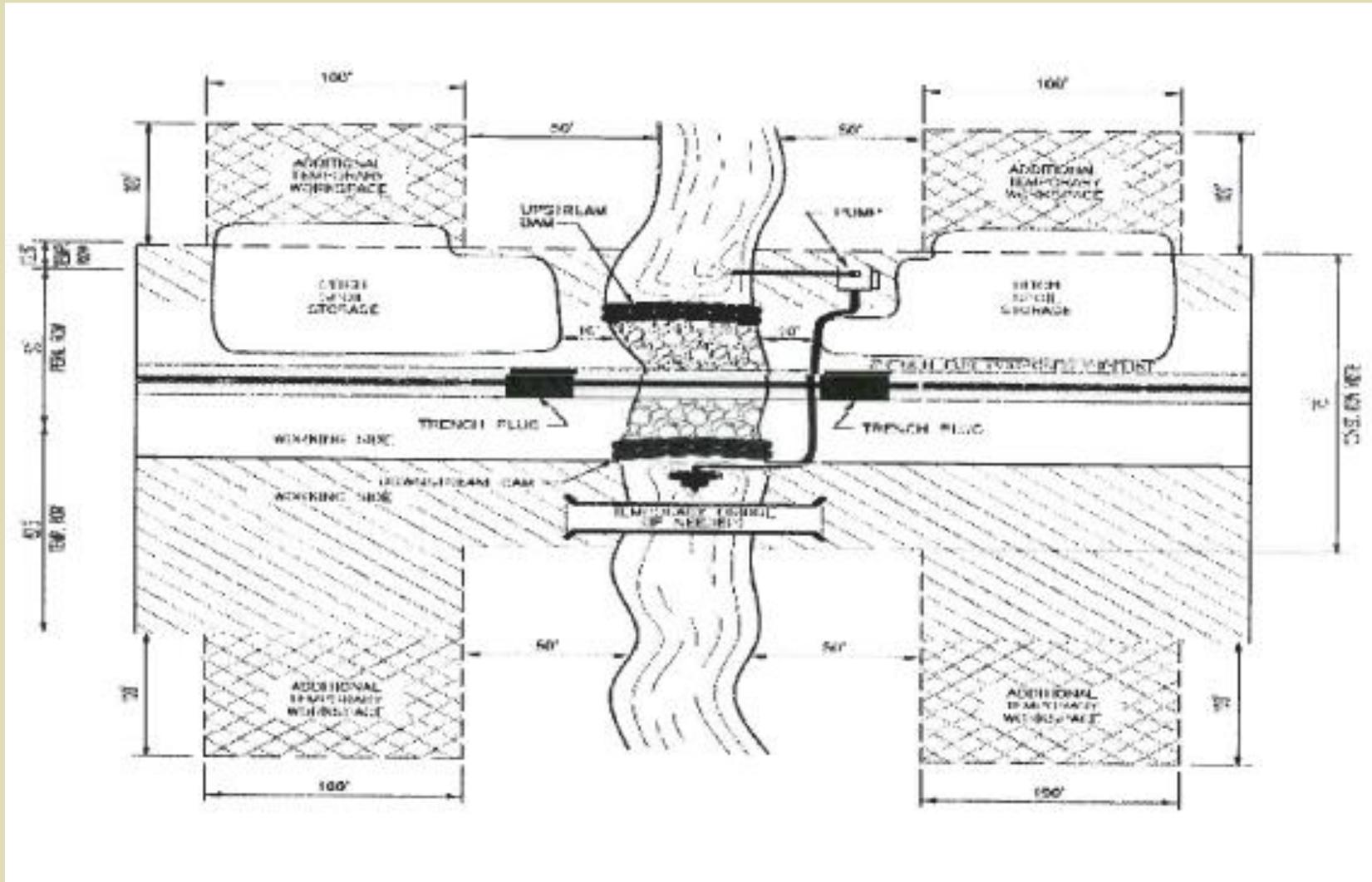
# Wetland & Stream Crossings

- Construction not allowed in flowing streams
- Implementation of typical utility ESC measures
- Must also utilize approved bridging measures including flume crossings, pump around, coffer dams, causeways/wood mats and directional drilling

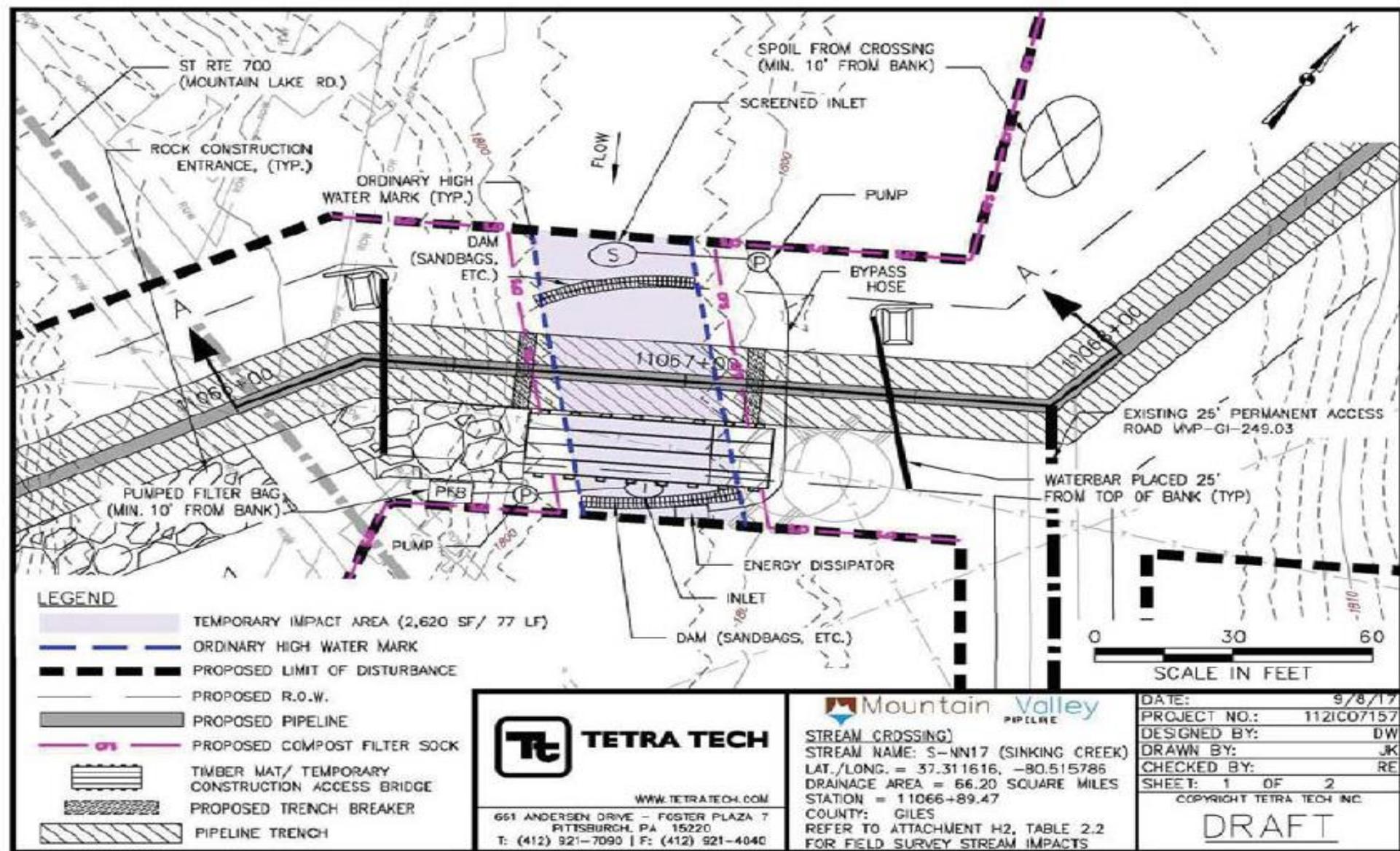
# Stream Crossing - Flumed Example



# Stream Crossing – Dam and Pump Example



# Detailed Stream Crossing



# Sequence of Pipeline General Construction Activities

- Survey & Stake Limits of Disturbance
- **Install perimeter ESC**
- Tree felling, clearing & grubbing
- **Install, seed, and mulch CWD**
- Grading
- Upgrade/construct Access Roads & Laydown Yards
- **Segregate Top Soil**
- Strip and stockpile
- **Seed and mulch stockpiles**
- Stake centerline
- **Install temporary waterbars**
- Create Benchwork area
- Excavate Trench
- **Segregate Top Soil**
- Trench preparation, stringing, bending, welding, pipe installation
- Trench backfilled w/segregated topsoil
- **Re-spread topsoil and disk**
- Final grading
- **Install permanent waterbars**
- Clean up
- Remove Clean Water Diversions
- **Seed and mulch ROW for final stabilization**

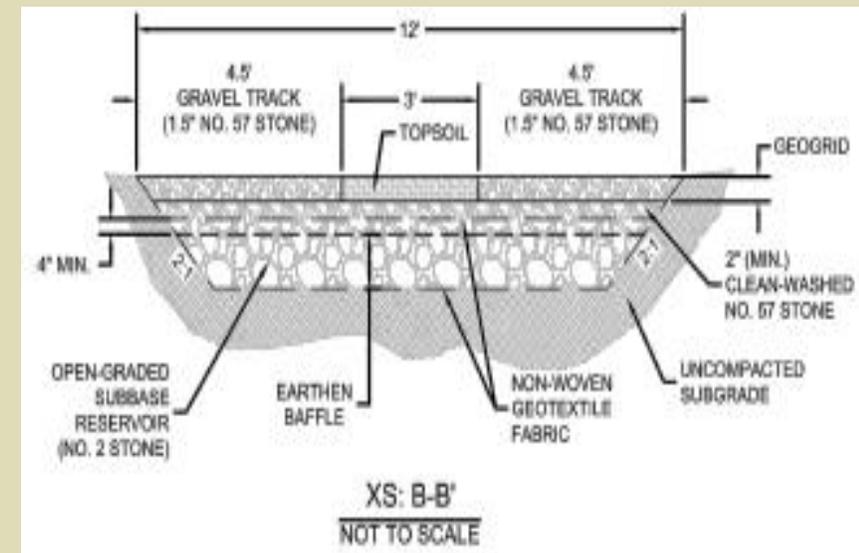
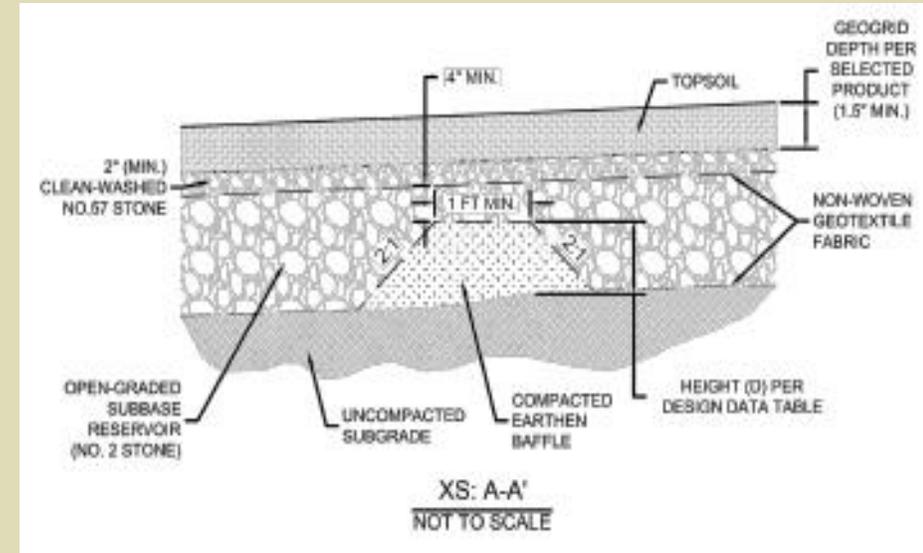
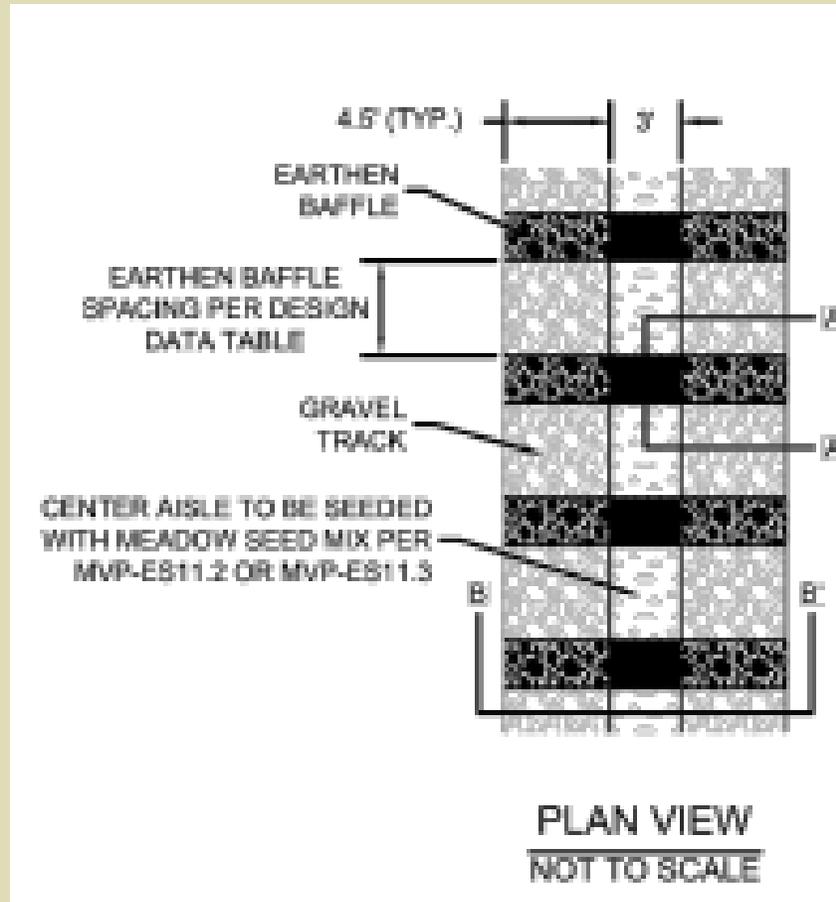
# Sequence of Pipeline Construction Activities

- During construction activities, temporary waterbars are installed at the end of each day following land disturbance and removed at the start of the following day.
- Temporary seed and mulch applied for stabilization to stockpiles or benchwork areas.
- Topsoil segregation will occur within limits of disturbance.

# Permanent Access Roads

- Low Impact Development (LID) proposed to address water quantity from permanent roads.
- Principle design elements similar to permeable pavement.
- MVP significantly decreased the number of permanent access roads from about 50 miles of proposed roads to approximately 12,000 linear feet of new roadways total.

# Permanent Access Roads



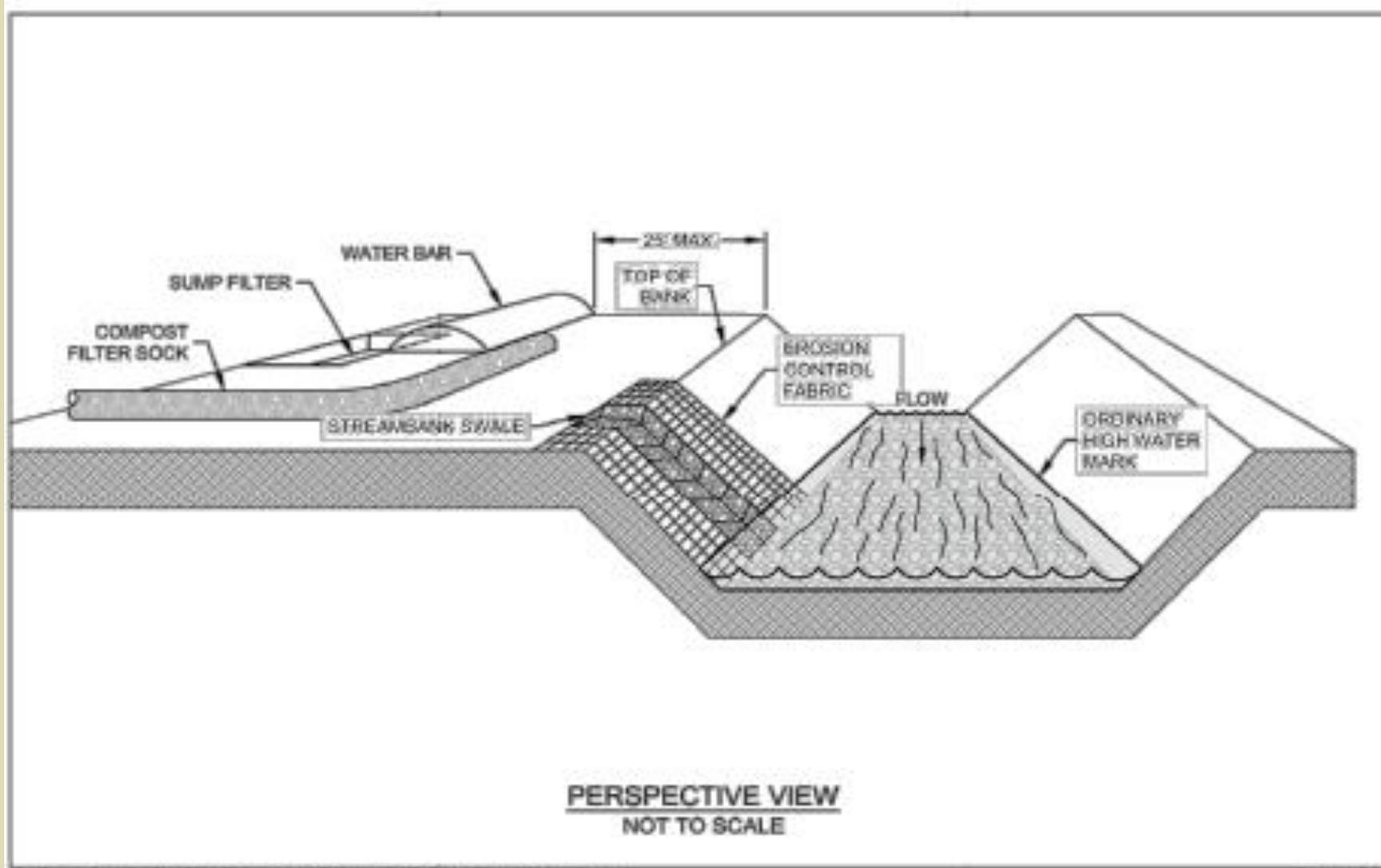
# Stormwater Technical Whitepaper

- Details conservative assumptions used in SWM calculations
- Demonstrates how the methodology meets water quality and quantity requirements in accordance with VSMP regulations (9VAC25-870) including:
  - Channel protection for concentrated flows met by the Energy Balance Method.
  - Flood protection for concentrated flows met by reduction in runoff from the 10-year 24-hour storm.
  - Sheet flow requirements met through no increases in sheet flow volumes and physical spreading via water bar end treatments.
- Implemented project wide

# Post Construction Stream Crossing

- Designed to prevent re-concentration of flow at post-construction waterbars
- Re-concentrated flow could cause edge of stream erosion
- Unique because of Virginia's stormwater management water quantity requirements
- Runoff diverted from water bar to sump and staged released level vegetated area to decrease concentrated flow volumes
- Any re-concentrated flow will be directed to an armored channel discharging to stream

# Post Construction Stream Crossing



# POST CONSTRUCTION ROW

