

**CHESTER COUNTY
AQUATIC RESOURCE
AVOIDANCE, MINIMIZATION, AND MITIGATION PLAN**

**SUNOCO PIPELINE, L.P.
PENNSYLVANIA PIPELINE PROJECT**

REVISED MARCH 2016

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1.0 INTRODUCTION

This plan addresses the impact avoidance, minimization, and mitigation measures for waterbodies and wetlands that would be affected by construction and operation of Sunoco Pipeline's, L.P. (SPLP) proposed Pennsylvania Pipeline Project (Project). SPLP proposes to construct and operate the Pennsylvania Pipeline Project (Project) that would expand existing pipeline systems to provide natural gas liquid (NGL) transportation of up to 700,000 barrels per day. The Project involves the installation of two parallel pipelines within an approximately 306-mile, 50-foot-wide right-of-way (ROW) from Houston, Washington County, Pennsylvania to SPLP's Marcus Hook facility in Delaware County, Pennsylvania with the purpose of interconnecting with existing SPLP Mariner East pipelines. A 20-inch diameter pipeline will be installed within the ROW from Houston to Marcus Hook (306 miles) and a second, 16-inch diameter pipeline, will also be installed in the same ROW. The second line is proposed to be installed from SPLP's Delmont Station, Westmoreland County, Pennsylvania to the Marcus Hook facility, paralleling the initial line for approximately 255 miles.

The Project includes two new, 20-inch and 16-inch diameter pipelines, respectively, with maximum operating pressures (MOPs) of 1,480 pounds per square inch gauge (psig) installed within or adjacent to 306 miles of existing ROW corridors. The majority of the new ROW will be co-located adjacent to existing utility corridors, including approximately 230 miles of pipeline that will be co-located in the existing SPLP Mariner East pipeline system that is currently used for the transportation of NGL's. The following provides the details of the proposed pipeline facilities:

- Pipeline 1: Houston, Pennsylvania to Marcus Hook, Pennsylvania – This is an incremental expansion of the capacities of Sunoco Logistics to transport NGL's to the Marcus Hook facility. This Phase of the Project will include a 20 inch diameter steel pipeline and pump stations. The route of the pipeline is either inside or adjacent to the existing Sunoco pipeline corridor for a majority of its length and is approximately 306 miles long.
- Pipeline 2: Delmont, Pennsylvania to Marcus Hook, Pennsylvania –The pipeline route for the second 16-inch pipeline will include 255 miles of pipeline that will parallel Pipeline 1.

Aboveground facilities associated with the Project include the following modifications:

- Houston, Pennsylvania has an existing facility which will connect to the pipeline. This Project will install meters on the outlets from existing storage, injection pumps, control valves, associated piping and accessory structures. New land disturbance will be required to accommodate the injection station component.
- Delmont, Pennsylvania has an existing facility and this Project will expand the pump station with added booster pumps, associated piping and accessory structures. Some new land disturbance within the existing station site will be required to accommodate this modification.
- Ebensburg, Pennsylvania, SPLP will construct a new pump station with booster pumps, leak detection metering, associated piping and accessory structures

adjacent to an existing station. Some new land disturbance within the existing station site will be required to accommodate this modification.

- Mount Union, Pennsylvania has an existing pump station and this Project will expand the pump station with added booster pumps, associated piping and accessory structures. Some new land disturbance will be required to accommodate this modification.
- Doylesburg, Pennsylvania has an existing pump station and this Project will expand the pump station with added booster pumps, associated piping and accessory structures. Some new land disturbance will be required to accommodate this modification.
- Middletown, Pennsylvania has an existing pump station and this Project will expand the pump station with added booster pumps, associated piping and accessory structures. Some new land disturbance will be required to accommodate this modification.
- Beckersville, Pennsylvania has an existing pump station and this Project will add to the pump station with leak detection metering, associated piping and accessory structures. Some new land disturbance will be required to accommodate this modification.
- Twin Oaks, Pennsylvania is an existing site and this Project will install custody transfer meters and control valves. Some new land disturbance will be required to accommodate this modification.
- There are 47 mainline valve sets planned for this Project, which will be placed at as many existing valve sites as possible. New land disturbances will be required to accommodate the installation and operation of most of the valve settings.

To thoroughly document the existing conditions in relation to wetlands and waterbodies, a 200-foot-wide study corridor centered on the proposed alignment was delineated for aquatic resources in accordance with U.S. Army Corps of Engineers' manuals. In some areas, such as valve settings, station settings/expansions, proposed temporary access roads, and where additional temporary workspace was identified, the study corridor was expanded. In summary, all proposed land disturbance areas and beyond were field inspected and aquatic resources identified, characterized, and mapped. The larger study corridor, allowed for identification of resources adjacent to proposed workspaces so that these resources could be mapped and protected from indirect impacts. In addition, the larger study corridor allowed for the examination of possible avoidance and minimization of direct and indirect impacts through pipeline alignment reroutes (see Attachment 17 - Alternatives Analysis).

Field delineation also provided valuable information in regards to stream flow and wetland classification. Streams were identified as ephemeral, intermittent, and perennial, as well as approximate depths and widths recorded. Wetlands were classified in accordance with standard Cowardin classifications and identified as palustrine emergent (PEM), palustrine scrub shrub (PSS), and palustrine forested (PFO). These field designations were combined with desktop analysis and agency input to determine

agency classifications (e.g., PADEP, Chapter 93) and other additional information in regards to the potential for presence of sensitive species so that an understanding of the function and value of each resource could be used during the avoidance and minimization planning process.

Field delineation surveys found a total of 1440 streams and 1640 wetlands within the Project study areas, of which 71 streams and 51 wetlands are located in Chester County (not all will be impacted by the Project, however). The Resource Tables included with the Environmental Assessment Form (Attachment 11) identify the streams and wetlands to be crossed and quantify the impacts for Chester County.

The Project has been designed to fulfil SPLP's overall project purpose to transport NGL and no additional actions or future impacts to water resources are necessary to meet this goal. Specifically, SPLP does not have any reasonably foreseeable future actions associated with this Project, in the Project area or areas adjacent thereto, and is committed to limiting the impacts to those identified in the Resource Tables (i.e., no future clearing of new right-of-way between HDD points); consequently, there are no secondary impacts associated with this Project.

Section 2 of this report summarizes the Project impacts to waterbodies and wetlands, and identifies the measures SPLP has already implemented, and the measures SPLP plans to implement, to avoid and minimize impacts to these resources. Section 3 identifies the compensatory mitigation, if required, and Section 4 provides a summary of the waterbody/wetland impacts and mitigation for Chester County.

2.0 IMPACTS AND IMPACT AVOIDANCE / MINIMIZATION MEASURES

This section describes the potential Project impacts to waterbodies and wetlands, and identifies measures SPLP has already implemented, or will implement, to avoid and minimize those impacts.

2.1 WATERBODIES

The proposed pipeline will cross a total of 71 waterbodies in Chester County. No stream relocations or permanent channel modifications are proposed. All stream banks and beds will be restored to original grade and the original stream bed material will be segregated and restored in accordance with the Project's Erosion and Sedimentation Control Plan.

A nominal construction workspace of 75 feet-wide is proposed and desired at stream crossings. However, to reduce impacts to these resources, SPLP has restricted the construction right-of-way at stream crossings to 50 feet-wide. This reduction will occur 10 feet before and 10 feet after the stream crossing. No permanent access roads or permanent fills associated with pump stations or valve settings are located within streams.

Therefore the direct disturbance to streambed and banks will be limited to the length of the stream within the 50-foot-wide workspace, as a result of excavating the pipeline trench and installing temporary equipment crossing structures. Based on this, a total of approximately 0.250 acre of direct stream disturbance will be temporarily required to

install the pipeline and temporary equipment crossing structures in streams in Chester County.

2.1.1 Summary of Impacts

The proposed Project will cross a total of 71 waterbodies in Chester County including 30 perennial streams, 17 intermittent streams, and 24 ephemeral streams. Construction would result in minor, short-term impacts to waterbodies; however, of the 71 waterbodies, 37 will be crossed underneath with conventional bores or HDD technology and no surface impact would occur. The temporary impacts would occur as a result of in-stream construction activities, as well as potential soil erosion from slopes immediately adjacent to stream channels, or trench dewatering. Activities would result in a temporary localized increase in turbidity levels and downstream sediment deposition. Suspended sediments could alter the physical characteristics of the water column (e.g., color and turbidity) on a short-term basis. In slack or slowly moving waters, increases in suspended sediment may increase the biochemical oxygen demand and temporarily reduce levels of dissolved oxygen in localized areas during construction. Motile organisms may avoid these areas, but sessile and some planktonic organisms may be adversely affected. However, no foreign sediments would be introduced as all dredged or fill material would consist of onsite sediments.

Aquatic life may be temporarily impacted at, or downstream from, the proposed pipeline crossings. Potential impacts include the degradation of benthic habitat due to direct disturbance to bottom substrate in the trench zone and associated disturbances to invertebrates and riparian and aquatic vegetation. Indirect short-term impacts from sedimentation may affect areas downstream of some crossings, depending on the type of construction method, bottom substrate, and flow conditions at the time of construction. As previously stated, SPLP does not have any reasonably foreseeable future actions associated with this Project and is committed to limiting the waterbody impacts to those identified in the Resource Tables even during operation and maintenance; consequently, there are no secondary waterbody impacts associated with this Project.

2.1.2 Impact Avoidance and Minimization Measures

Due to the linear nature and length of the proposed Project and the abundance of stream resources in Pennsylvania, total avoidance of all stream crossings was not possible or practicable for this Project. However, through substantial project planning (including route selection, design of workspaces, and selection of construction and restoration methods), SPLP has avoided and minimized impacts to streams and waterbodies to the maximum extent practicable.

For initial routing of the proposed Project, SPLP sited the proposed Pennsylvania Pipeline Project along existing utility corridors, including approximately 230 miles of pipeline that will be co-located in the existing SPLP Mariner East pipeline system. Construction of new pipelines of this diameter would typically require a construction right-of-way (ROW) width of 75 feet and is what will be used for the majority of the alignment. However, as discussed above, SPLP has limited the proposed Project's construction ROW through waterbodies to the 50-foot-wide existing ROW to reduce impacts to these sensitive resources and this reduction will be 10 feet before and after the crossing.

SPLP was diligent in siting additional workspaces to minimize impacts to waterbodies to the maximum extent practicable for the entire Project. Although additional temporary workspace (ATWS) areas will be required at some waterbody crossings, all ATWS areas (i.e., extra workspace areas in addition to the main 75-foot-wide construction ROW) were sited outside of the stream channel and to the maximum extent practicable outside of the PADEP defined floodway. SPLP will also be implementing Horizontal Directional Drill (HDD) technology at all of the large waterbody crossings to further reduce direct impacts to stream channels and lakes/reservoirs. As outlined in the Alternatives Analysis (Attachment 17), the direct temporary impacts to streams has been significantly reduced due to these efforts. The crossing methods can be found within the Resource Tables included with the Environmental Assessment (Attachment 11).

Furthermore, erosion and sedimentation controls will be installed and maintained in accordance with Pennsylvania's Erosion and Sediment Control Regulations and PADEP's Erosion and Sediment Control Best Management Practice (BMP) Manual, as well as consideration of the Federal Energy Regulatory Commission's (FERC's) erosion and sedimentation control measures, to minimize impacts on waterbodies. These controls, procedures, and BMPs are emulated within the Project's Erosion and Sedimentation Control Plan (Attachment 12), which will receive full PADEP and County Conservation Department review and approvals. In addition, SPLP has developed a stand-alone Inadvertent Return Contingency Plan (Appendix A of this Attachment) that outlines the pre-construction and construction procedures for reducing the risk of inadvertent returns, as well as the procedures for inspecting, reporting, containing, and restoring discovered returns.

SPLP will construct stream crossings in accordance with all PADEP and USACE restrictions and conditions set forth with the authorizations received in regards to Chapter 105 and Chapter 102 acknowledgments and authorizations.

2.1.2.1 Construction Methods

The following construction methods will be used and selected on a stream-specific basis for installation of the pipeline across streams. These methods are also discussed in detail within the Project's Erosion and Sedimentation Control Plan (Attachment 12). The crossing method for each stream can be found within the Resource Tables included with the Environmental Assessment (Attachment 11).

Timing

Minimizing the duration of in-stream disturbances is a key factor in minimizing impacts. Therefore, SPLP will generally complete in-stream work in minor waterbodies (<10 feet wide) within 24 hours, and in intermediate waterbodies (10 to 30 feet wide) within 48 hours.

Dry Stream Crossing Methods

Dry stream crossing methods involve in-stream excavation and continuous water flow in the stream, but feature construction techniques that allow the water to be isolated and conveyed cleanly downstream, either through or around the construction area. Dry crossing methods include the Flume Crossing Method and Dam & Pump method. Selection of which dry method will be used will be determined in the field at the time of crossing, by the contractor and SPLP's Environmental Inspector. The method selected will be the method that is best suited to the physical stream conditions, provides the least disturbance, and the most expedient crossing to minimize overall impact.

Flume Stream Crossing Method – A flumed crossing involves collecting and directing the stream flow through a culvert or flume across the trench line work area. This allows for the trenching, pipe installation, and initial restoration to occur in dry conditions, underneath the flume set-up, while maintaining continuous downstream flow. Soil characteristics must be very stable and stream flow should be low to moderate for this method to be used successfully and safely. The flume pipe must be long enough to account for the possibility of the trench widening unexpectedly during the excavation (due to sloughing). An effective seal must be created around the flume(s) so that water will not penetrate and possibly wash out the in-stream dam on either the inlet and/or outlet end. Once in place, the flumes are not removed until the pipeline has been installed and the streambed and banks have been restored.

Dam & Pump Crossing Method – A dam and pump crossing involves construction of a dam on the upstream end of the trench work area, from which a pump and pipe or hose are used to convey stream flow around the work area and discharge the water downstream of the work area. Similar to the flumed crossing method, the dam & pump allows for a dry trench workspace area, but is often used in streams with curved or meandering channels where effective placement of a straight flume pipe is not feasible. The dam and pump method requires the intake to be screened to avoid entrainment of fish. Key considerations of this method involve ensuring that the pumps used are sufficient to handle the flow, back-up pumps are onsite in the event of malfunctions, pump intakes are screened, and pump operation is monitored throughout their use to prevent streambed scour at the discharge point and ensure proper operation.

Horizontal Directional Drilling (HDD)

For HDD crossings, a specialized drill rig is used to advance an angled borehole below the stream to be crossed and, using a telemetry guidance system, the borehole is “steered” beneath the stream and then back to the ground surface. The hole is then reamed to a size adequate for the pipe to pass through, and the pipeline is then pulled back through the bore hole.

SPLP has developed specific details regarding the proposed HDD crossings, including entry and exit locations and size, site-specific plans (to scale) with areas of disturbance and contingency mitigation measures to contain and clean up inadvertent release of drilling mud (in case of occurrence). A project-specific Inadvertent Return Contingency Plan has been developed and will be incorporated into the Erosion and Sediment Control Plan.

Use of HDD would generally not be time-restricted like other stream crossings, since it involves no work within or impact to the streambed, stream banks, or water quality.

Conventional Bore

A conventional bored crossing requires the excavation of bore pits on each side of the stream being crossed. Drilling equipment is used to install a horizontal bore hole from one bore pit to the other. The pipeline is then pulled through the bore hole. Use of a bored crossing should not be time-restricted since it involves no work within or impact to the streambed, stream banks, or water quality.

Similar to the HDD method, a conventional bore would generally not be time-restricted like other stream crossings, since it involves no work within or impact to the streambed, stream banks, or water quality.

Open-Cut Crossing

If any stream is dry or has no perceptible flow at the time of construction, an open-cut crossing method may be used. For open-cut crossings, a backhoe, clam dredge, dragline, or similar equipment will be used for trench excavation. As a rule, the completion of all in-stream construction activities should occur the same day it is begun. The pipe will be welded together in the staging areas and then carried along the ROW into place. If the streambed is composed of unconsolidated material, the pipe will be pulled into place. In rock-bottomed streams, the pipe will be lifted across, and then lowered into place. After the pipe is lowered into the trench and backfilled, streambeds will be restored to their former elevations and grades, and all stream banks will be restored and stabilized with appropriate erosion control measures (Attachment 12).

Access Roads

Of total 71 streams crossed by the proposed Project in Chester County, one (1) of these is crossed by proposed temporary access roads and/or travel lanes. No permanent access roads or bridges will be constructed across stream channels.

Other Construction Impact Minimization Procedures

The proposed construction procedures are designed to ensure that potential impacts at all stream crossings are minimized to the maximum extent practicable. To limit the time required for construction of a stream crossing, the ROW will be prepared on either side of the stream prior to initiating the actual crossing. Stream crossings will be perpendicular to the flow, to the extent practical. If necessary, the pipe used for stream crossings and in floodplains will be weighted to prevent flotation. The pipe will be welded together in the staging areas and then carried or floated along the ROW into place. If the streambed is composed of unconsolidated material, the pipe will be pulled into place. In rock-bottomed streams, the pipe will be floated or lifted across and then lowered into place. After the pipe is lowered into the trench, previously excavated material will be returned to the trench line for backfill. Stream flow will be maintained at all waterbody crossings, and no alteration of the stream's capacity will occur as a result of pipeline construction. Stock piling of soil will be a minimum of 10 feet from top of stream bank and stream bed material will be segregated and restored upon backfilling.

After the completion of construction, streambeds will be restored to their former elevations and grades. Trench plugs shall be installed within the trench on both sides of the stream channel. Spoil, debris, sandbags, flume pipes, construction materials, and any other obstructions resulting from or used during construction of the pipeline will be removed to prevent interference with normal water flow and use. Any excavated material not used as backfill will be disposed of in a manner and at locations satisfactory to the agencies having jurisdiction. Following grading, all stream banks will be restored and reseeded to prevent subsequent erosion, in accordance with permit requirements.

SPLP has developed, as part of their ESCGP-2 application, a plan to satisfy the applicable requirements of federal and state regulatory programs, consistent with PADEP August 2005 Guidelines for the Development and Implementation of Emergency Response Plans. Specifically, the plan provides for a course of action to protect the local environment from an event that interrupts the normal operation at the site and could result in a threat to health and/or the environment if not properly addressed. In addition, SPLP will generally follow the waterbody impact avoidance and minimization measures outlined in FERC's Upland Erosion Control, Revegetation, and Maintenance Plan (Plan) and Procedures to the extent practicable. Implementation of the procedures in these plans will prevent, minimize, and control, if necessary, any inadvertent spill of hazardous materials such as fuels, lubricants, and solvents. In addition, the Inadvertent Return Contingency Plan (Appendix A) outlines the procedures necessary to address any potential release of drilling fluids during an HDD crossing method.

With the exception of certain hydrostatic test water intake locations, sites for refueling and routine servicing of equipment and storage of fuels, lubricants, and any other materials that could potentially contaminate waterbodies would be located in upland locations at least 100 feet from the edge of the nearest waterbody where site conditions allow. Adequate supplies of suitable absorbent material and any other supplies and equipment necessary for the immediate containment and cleanup of inadvertent spills would be available on all construction spreads.

Other impact minimization/mitigation measures for streams include the installation of temporary and permanent erosion controls, the control and monitoring of trench dewatering activities to prevent silt-laden water from entering streams and wetlands, the

use of properly constructed equipment bridges to travel across each stream, and restrictions on refueling near streams and wetlands.

2.2 WETLANDS

A total of 26 wetlands will be crossed for a total, direct and temporary disturbance of approximately 3.39 acres of wetlands during construction. These acreages exclude areas that will be crossed by conventional bores or HDDs. No permanent fill in wetlands is proposed; consequently, no loss of wetland area would result from construction or operation of the proposed pipeline. One (1) forested wetland, Wetland H15 in Chester County will have a 0.047 acre permanent conversion of forested wetland cover type to emergent wetland cover type would occur. All other wetland impacts will be allowed to revert to their pre-construction vegetative successional stage or be planted to their original cover type.

2.2.2 Summary of Impacts

Although SPLP was diligent in situating the proposed Project to avoid wetlands to the extent practicable, the Project in Chester County will cross a total of 26 wetlands and directly impact approximately 3.373 acre of PEM, 0.007 acre of PSS, and 0.047 acre of PFO. These acreages exclude areas that will be crossed by conventional bores or HDDs. No wetlands will be permanently filled or lost as a result of the Project. All wetlands temporarily affected by construction will be restored as wetlands. In open (PEM) areas with herbaceous cover, recolonization of disturbed ground by annual and perennial species is characteristically rapid, often occurring within one growing season, and these impacts are expected to be minor and short-term. Temporarily impacted PSS and PFO wetlands located outside of the permanent right-of-way will be replanted with native trees and shrubs. Scrub-shrub wetland areas located in the permanent right-of-way will be planted with wetland shrubs and “No Mowing” signs will be installed to ensure long-term protection of the replanted scrub-shrub wetland areas. Forested wetland areas within the permanent right-of-way will be allowed to revert to emergent/scrub-shrub wetlands.

As presented in Enclosures C and D of the Environmental Assessment Form (Attachment 11), the wetlands traversed by the proposed Project offer a variety of functions and values that will not be adversely impacted and will be restored/regained following pipeline construction. The majority of impacts to wetland functions and values will be short-term and limited to the construction period and possibly the first growing season when the temporarily disturbed areas are revegetated/planted with native species. The only long-term impact associated with wetland functions and values would be the permanent conversion of forested vegetation to emergent/scrub-shrub vegetation (i.e., wildlife habitat and recreation). However, due to SPLP’s efforts to avoid and minimize forested wetland impacts the amount of wetland vegetation conversion is considered insignificant and de minimus. Therefore, the overall functions and values associated with the wetland complexes crossed by the Project will not be adversely affected.

As previously stated, SPLP does not have any reasonably foreseeable future actions associated with this Project and is committed to limiting the wetland impacts to those identified in the Resource Tables even during operation and maintenance; consequently, there are no secondary wetland impacts associated with this Project.

2.2.2 Impact Avoidance and Minimization Measures

Due to the linear nature and length of the proposed Project and the abundance of wetland resources in Pennsylvania, total avoidance of all wetland crossings was not possible or practicable for this Project. However, through substantial project planning (including route selection, design of workspaces, and selection of construction and restoration methods), SPLP has avoided and minimized impacts to wetlands to the maximum extent practicable.

As stated in Section 2.1.2, an important factor for wetland impact minimization was SPLP's siting of the proposed Pennsylvania Pipeline Project's ROW to parallel and overlap an existing ROW. This eliminated impacts to undisturbed wetland resources, by restricting all construction activities to a 50-foot-wide ROW and maintaining the permanent operational ROW at 50 feet. Additional temporary workspace areas (ATWS), permanent access roads, and permanent fills have been located outside wetland areas to reduce long term impacts to wetlands. In addition, SPLP has incorporated the HDD construction method to avoid large forested wetland expanses and exceptional value wetlands that support species of concern. As outlined in the Alternatives Analysis (Attachment 17), the direct impacts to wetlands, in particular forested wetlands has been significantly reduced due to these efforts. The wetland crossing methods can be found within the Resource Tables included with the Environmental Assessment (Attachment 11).

Furthermore, erosion and sedimentation controls will be installed and maintained in accordance with Pennsylvania's Erosion and Sediment Control Regulations and PADEP's Erosion and Sediment Control Best Management Practice (BMP) Manual, as well as consideration of the FERC's erosion and sedimentation control measures, to minimize impacts on wetlands. These controls, procedures, and BMPs are emulated within the Project's Erosion and Sedimentation Control Plan (Attachment 12), which will receive full PADEP and County Conservation Department review and approvals. In addition, SPLP has developed a stand-alone Inadvertent Return Contingency Plan (Appendix A) that outlines the pre-construction and construction procedures for reducing the risk of inadvertent returns, as well as the procedures for inspecting, reporting, containing, and restoring discovered returns.

Replanting

To minimize the temporary loss of trees and shrubs in forested and scrub-shrub wetland areas located in the temporary construction right-of-way in Chester County, SPLP will replant all temporarily impacted scrub-shrub in the permanent right-of-way and temporary workspaces. SPLP will restore these areas by planting native wetland shrubs and installing "No Mowing" signs to ensure long-term protection of the replanted scrub-shrub wetland areas. The single forested wetland area within the permanent right-of-way will be allowed to revert to an emergent/scrub-shrub wetland.

This is consistent with the USACE's standard recommendations for restoration of oil and gas projects under Section 404 of the Clean Water Act. This will minimize the duration of impacts in forested/scrub-shrub wetland areas, where plantings will provide a "jump start" on forest re-growth, minimizing temporary impacts on the wetland systems' functions and values. This restoration planting program will be conducted after all major

pipeline construction activities have been completed and the workspace has been restored to pre-existing contours and soil morphology.

The species to be planted will be the same or similar native/non-invasive, hydrophytic species that were temporarily removed, and that are growing within adjacent wetland areas or are common to the region. Planting will be conducted by a qualified and reputable landscape contractor or arborist, under the supervision of a qualified Environmental Inspector (EI) who is contracted by SPLP to provide oversight of the restoration activities. The landscape contractor and EI will be provided a copy of a detailed wetland mitigation plan with wetland-specific drawings, and apprised of SPLP's obligations under the plan and applicable permit conditions. The scrub- shrub wetland areas will be planted with tree/shrub species consisting of two- to three-foot whip sized individuals in a variety of facultative wetland species. Forested wetland areas located in the temporary right-of-way will be planted with containerized tree (approximately 1-inch diameter at breast height) species native to the area and commonly found in the local wetlands. Since the tree stumps will be left in place, except over the pipeline, natural recruitment and sprouting is anticipated; therefore, containerized trees will be planted at a density similar to the adjacent undisturbed forested wetland. No cultivars or other ornamental native-species will be allowed as substitutes.

To ensure successful completion and increased survivorship of individual plantings, SPLP anticipates planting in either the fall immediately following completion of Project construction, or during the following year. If actual construction completion timeframes do not accommodate a fall 2016 planting schedule, then SPLP will conduct the plantings as soon as recommended and practicable during the 2017 growing season. The timing of planting will be in accordance with guidance and recommendations from a qualified landscape contractor or arborist, depending on the plant species and/or locations. In general, landscape plants installed in March, April, and May benefit from generous rains and the long growing season to come. But often, too much precipitation makes planting difficult, especially on poorly drained sites. Also, the quick onset of hot, dry weather that might displace a short spring season can injure new young plantings. Because of these difficulties, fall planting is often favored. Ideally, planting would be done from mid-August to mid-October, a period of generally moderate and relatively stable air temperatures, with soil temperatures and moisture levels usually in a range that promote rapid root development.

Installation of the plantings will be conducted using foot traffic and hand tools to the extent practicable, to avoid unnecessary impacts to restored wetland areas as a result of planting activities. Where necessary, the landscape contractor shall use sheets of plywood or equivalent material for weight distribution along travel routes within saturated wetlands to protect soils from excessive rutting, compaction, or topsoil and subsoil mixing by foot traffic.

Monitoring of these planted wetland areas will occur as part of SPLP's annual wetland monitoring program and will be in accordance with PADEP and USACE permit conditions regarding monitoring. Maintenance of these planted areas will focus on a key element: avoiding accidental mowing of these areas during routine ROW vegetation maintenance. To protect these planted areas from accidental mowing by SPLP's ROW maintenance crew and others, SPLP will install "No Mow Zone" markers at the entry and exit points, and along the edge of the planted areas along the pipeline's permanent

ROW. This will demarcate the tree planting/growing area and signal the mowers to avoid mowing in these areas.

For Chester County, 1 PFO locations, Wetland, H15 will be directly impacted and is located within the permanent ROW. This 0.047 acre area will be allowed to restore to the wetland condition, but will need to be maintained as permanent ROW.

2.2.2.1 Construction Methods

Construction in Wetlands with Unsaturated Soils

The construction technique used to cross wetlands with stable, unsaturated soils at the time of construction will be similar to those used in dry upland areas. Soils may be dry and stable enough to support equipment without additional timber mat/riprap equipment support, and pipe may be strung along the ROW on skids through the wetland. Vegetation will be cut just above ground level, leaving root systems in place. Grading and pulling of stumps will be limited to only the trench line area, and where required, to ensure safe operation of construction equipment. Wetland topsoil will be segregated from subsoil in the trench line area and stored in separate piles while the trench is open. The segregated soils will be backfilled in the proper order, with topsoil on top, and the preconstruction surface contours will be restored. Trench breakers will be placed in the trench at the base of slopes near the wetland boundaries prior to backfilling to prevent draining of the wetland along the trench line. No upland soil or fill material will be backfilled or imported into the wetland. The wetland areas will be returned to their preconstruction grade, mulched, and seeded with a native wetland seed mixture. The wetland will be seeded with annual ryegrass to quickly establish a short-lived vegetative cover, allowing the wetland's native seed and rhizomes (contained in the topsoil) to reestablish dominance naturally over time. No lime or fertilizer will be applied in wetlands.

Construction in Wetlands with Saturated Soils

In wetlands with wet, saturated soils at time of construction, topsoil will be segregated over the trench line if possible. Construction in saturated wetland areas may involve either the "drag section" or the "push/pull" technique.

Drag Section Technique – The drag section technique involves the use of equipment that can carry a prefabricated section of pipe into the wetland for placement into the excavated trench, if soil conditions permit. This technique requires the installation of equipment support (such as timber mats) along the working side of the trench to provide a stable work surface and minimize soil disturbance and rutting. Clean-up and restoration procedures will be similar to those previously described for wetlands with unsaturated soils with the additional step of removing the equipment support from the wetland.

Push-Pull Technique – The push/pull technique is one that is generally used only in wetlands with standing water or soils that are saturated to the surface. The trench may be excavated using either a backhoe (working on equipment supports in the wetland) or a dragline or clamshell dredge (working either in the wetland or from the edge of the wetland, depending on wetland size and extent of soil saturation). A prefabricated pipe is pushed from the edge of the wetland and/or pulled (e.g., with a winch) from the

opposite bank of the wetland into the excavated trench. Floats may be attached to the pipe to give it positive buoyancy, allowing it to be “floated” into place over the excavated trench. Once the pipe is positioned, these floats will be removed and the pipe will settle to the bottom of the trench and the trench will then be backfilled. The push/pull technique enables the pipeline to be installed with minimal equipment operating in the wetland.

Construction Impact Minimization Procedures

The proposed construction procedures are designed to ensure that potential impacts to wetlands are minimized to the fullest extent practicable. SPLP will implement wetland crossing procedures and wetland protection measures outlined in the Project’s Erosion and Sedimentation Control Plan’s BMPs (Attachment 12) to further minimize impacts to wetlands crossed by the proposed Project.

Temporary construction impacts in wetlands may include loss of herbaceous and shrub vegetation; wildlife habitat disruption; soil disturbance associated with grading, trenching, and stump removal; sedimentation and turbidity increases; and hydrological profile changes. To minimize vegetation disturbance, SPLP will limit the construction ROW width to 50 feet in wetlands and will implement a number of HDDs to avoid impacts as much as possible to EV and forested wetland areas. Disturbance will be further minimized by restricting equipment access in sensitive wetlands to machinery needed for actual pipeline installation, and by limiting the number of crossings. To further minimize impacts to wetlands, SPLP will implement erosion and sediment control measures to prevent soils disturbed by construction activities from leaving the construction area and entering wetlands. This will include implementing spill prevention and response procedures to avoid impacts from refueling of equipment and fuel storage within the vicinity of wetlands.

Confining stump removal in wetlands to the trench line (unless safety or access considerations require stump removal) will minimize soil disturbance and retain sources for re-sprouting and re-growth of wetland vegetation. Erosion control techniques, including installation of silt fences, slope breakers, trench plugs, rip-rapping, terracing, netting, restoration, and revegetation will be used in upland areas to restrict sediment runoff into adjacent wetlands.

Preconstruction wetland conditions in the ROW will be restored to the extent possible to promote revegetation by natural succession. Topsoil segregation in unsaturated wetlands will preserve the native seed source, which will facilitate regrowth of herbaceous vegetation once pipeline installation is complete. In addition, wetland contours will be restored and wetlands will be allowed to revert to naturally indigenous vegetation. The revegetation process will be monitored periodically. If excessive erosion occurs, these areas will be stabilized and revegetated.

In accordance with the Erosion and Sediment Control Plan, where the pipeline trench may drain a wetland, SPLP will install trench breakers and/or seal the trench bottom as necessary to maintain the original wetland hydrology. In addition, SPLP will install a permanent slope breaker and trench breaker at the base of slopes near the boundary between the wetland and the adjacent upland area.

Restoration seeding will consist of temporary/annual herbaceous vegetation (annual rye grass) to quickly stabilize the soils, while allowing the indigenous vegetation to naturally reestablish itself over time in the wetland.

Other impact minimization/mitigation measures for wetlands include the installation of temporary and permanent erosion controls, the control and monitoring of trench dewatering activities to prevent silt-laden water from entering wetlands, and restrictions on refueling near wetlands.

Finally, SPLP will coordinate with PADEP and the USACE during permitting under Section 404 of the Clean Water Act and associated Pennsylvania Water Obstruction and Encroachment procedures to determine any additional wetland mitigation measures that may be required.

2.3 CO-LOCATION AVOIDANCE/MINIMIZATION ANALYSIS

In order to gain a better understanding of the benefits of SPLP's efforts to co-locate the project with its existing pipeline ROWs and maintained areas on reducing new impacts to wetlands and streams, an analysis of the overlap of the proposed permanent ROW with existing ROWs and maintained areas was performed. In general, the PPP parallels SPLPs existing 8-inch pipeline for the majority of its length from its Delmont facility to the Twin Oak facility, but the area maintained varies from 40 to 50 feet-wide. There are some areas that required pulling away from the existing line. In particular, approximately 70 percent of the line in Blair and Delaware counties does not parallel SPLP owned and operated ROWs. These deviations were necessary due to constructability constraints and avoidance of other environmental and cultural concerns as described in the Alternatives Analysis section. In Washington, Westmoreland, and Allegheny counties, the line parallels SPLP's existing Mariner-1 12-inch pipeline for 51 miles between SPLP's Houston and Delmont facilities and a 50-foot-wide permanent easement has been established for this section of the line.

For this minimization analysis it was conservatively assumed that the Delmont to Twin Oaks section is maintained at 40 feet-wide by SPLP operations. This is primarily due to the lack of legally defined easements widths for the majority of this section due to the age of the line and the agreements. In general the 8-inch line has been maintained at a width necessary to operate it and that ranges from 40-50 feet. For the parallel with the Mariner-1 12-inch pipeline, a 50-foot-wide maintained area was used for this minimization analysis due to the recently established ROW with legally defined limits. Using GIS, these existing ROWs and maintained areas were compared to workspaces proposed for the PPP and the acreage overlap reported for wetlands and the linear footage overlap reported for stream crossings.

Project wide, there is approximately 39 acres of impacts to wetlands with implementation of the proposed project and 12 acres is estimated to be previously disturbed and within already maintained areas. Project wide, there is approximately 55,211 feet of impacts to streams with implementation of the proposed project and 15,266 linear feet is estimated to be previously disturbed and within already maintained areas. The table below provides a breakdown by county of the minimization effort.

County	Wetlands		Streams	
	Total Proposed PPP Impact (acres)	Total Overlap with Other SPLP Maintained Areas (acres)	Total Proposed PPP Impact (linear feet)	Total Overlap with Other SPLP Maintained Areas (linear feet)
Washington	0.53	0.30	2,471	2,223
Allegheny	0.36	0.35	1,533	1,436
Westmoreland	3.45	1.46	7,503	4,784
Indiana	1.49	0.14	4,742	320
Cambria	4.90	1.96	6,181	1,344
Blair	3.33	0.08	2,883	49
Huntingdon	3.52	1.09	7,558	893
Juniata	0.25	0.01	2,222	357
Perry	1.29	0.48	2,132	284
Cumberland	7.22	2.53	5,566	1,444
York	0.40	0.24	1,231	280
Dauphin	1.84	0.36	2,079	197
Lebanon	1.19	0.4	2,161	722
Lancaster	1.89	0.57	863	177
Berks	2.38	0.65	2,694	335
Chester	3.75	1.38	2,001	265
Delaware	1.32	0	1,391	156
TOTALS	39	12	55,211	15,266

3.0 COMPENSATORY MITIGATION

In accordance with PA Code 105.20a, all wetland impacts are considered temporary and adhere to PADEP's replacement criteria. Specifically, there will be no loss in wetland area/acreage (1:1 area ratio satisfied) and all replacement/restoration will be completed on site (siting criteria satisfied). Although there will be an insignificant/de *minimus* loss of wetland functions or values associated with the conversion of forested wetlands to emergent/scrub-shrub (0.047 acre or 1.38% of total wetland impacts) within the permanent right-of-way, the overall functions and values of the wetland complexes crossed by the Project will not be adversely affected.

Therefore, no compensatory mitigation is required as part of the Project in Chester County: SPLP's impact avoidance and minimization measures have successfully resulted in negligible long-term, permanent wetland or stream impacts. Specifically, there will be no net loss of wetland area and sensitive resources have been avoided via HDD crossing techniques, to the maximum extent practicable. Accordingly, the impact avoidance and minimization measures that have already been implemented, and will be implemented during construction and restoration, are considered adequate to address and mitigate all wetland and stream impacts associated with the Project.

4.0 CONSTRUCTION INSPECTION AND POST-CONSTRUCTION MONITORING

During preconstruction planning and construction, SPLP will implement a rigorous environmental inspection program that will involve the hiring of several Environmental Inspector's (EI), training of construction personnel/contractors, and implementing the Environmental Inspection Plan. EI teams will be organized by construction spread and will consist of Lead EIs and EIs trained and experienced in linear pipeline environmental construction. These EIs will provide environmental training of construction personnel to ensure all regulations and commitments are followed and natural resources are protected. Where required, EIs that have specialized skills and/or possess the appropriate qualifications and permits to monitor sensitive resources or resource areas (e.g., bog turtle or timber rattlesnake specialists) will be hired.

SPLP will adhere to all post-construction monitoring conditions identified in the PADEP and USACE authorizations.

5.0 SUMMARY

SPLP has incorporated a number of measures and approaches throughout the planning and construction phases of the Project to avoid and minimize potential impacts to surface water resources and wetlands. A number of measures were, and are still being implemented during Project routing, planning for workspaces, determining suitable construction methods, developing and following agency-approved plans, and working with agencies and landowners to address concerns and obtain permits.

Based on SPLP's efforts to avoid and minimize environmental impacts in Chester County, the proposed Project will temporarily impact:

- A total of **71** streams for a total of **0.250** acre. No stream relocations or permanent channel modifications are proposed.
- A total of **26** wetlands for a total of 3.390 acres. No permanent fill in wetlands is proposed, and consequently, no loss of wetland area would result from construction or operation of the proposed pipeline.
- A permanent conversion of **0.047** acre of forested wetland cover type will occur in Chester County. However, this impact is *de minimus*, unavoidable, and will not adversely impact the wetland resource at that location or the wetland resources of the County or Commonwealth.

No compensatory mitigation is required; all impacts are temporary and all waterbodies and wetlands will be restored to their pre-existing conditions.