



**Analysis of Impacts on Wetlands and Buffers**  
**Proposed Leidy Southeast Franklin Loop D Pipeline**  
**Monroe and Luzerne Counties, Pennsylvania**

**Analysis of Impacts on Wetlands and Buffers  
Proposed Williams Transco Leidy Southeast  
Franklin Loop D Pipeline**

Monroe and Luzerne Counties, Pennsylvania

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## INTRODUCTION

The proposed 42-inch diameter natural gas pipeline D of the Franklin Loop is to extend for 11.5 miles across rural sections of Monroe and Luzerne Counties, Pennsylvania, alongside other buried pipelines in the right-of-way (ROW) of the Transco Williams Leidy Southeast pipeline (Figure 1). The existing, maintained ROW has a variable width footprint 100 to 125 feet wide, which is proposed to be expanded to construct the new pipeline. Installation of the proposed pipeline will occur within a 105-foot wide construction corridor that partially overlaps the existing ROW by varying distances. The Applicant states that a 90-foot wide construction corridor is needed through some of the wetlands encountered by the new pipeline, but it will try to limit the corridor to 75 feet (Figure 2).

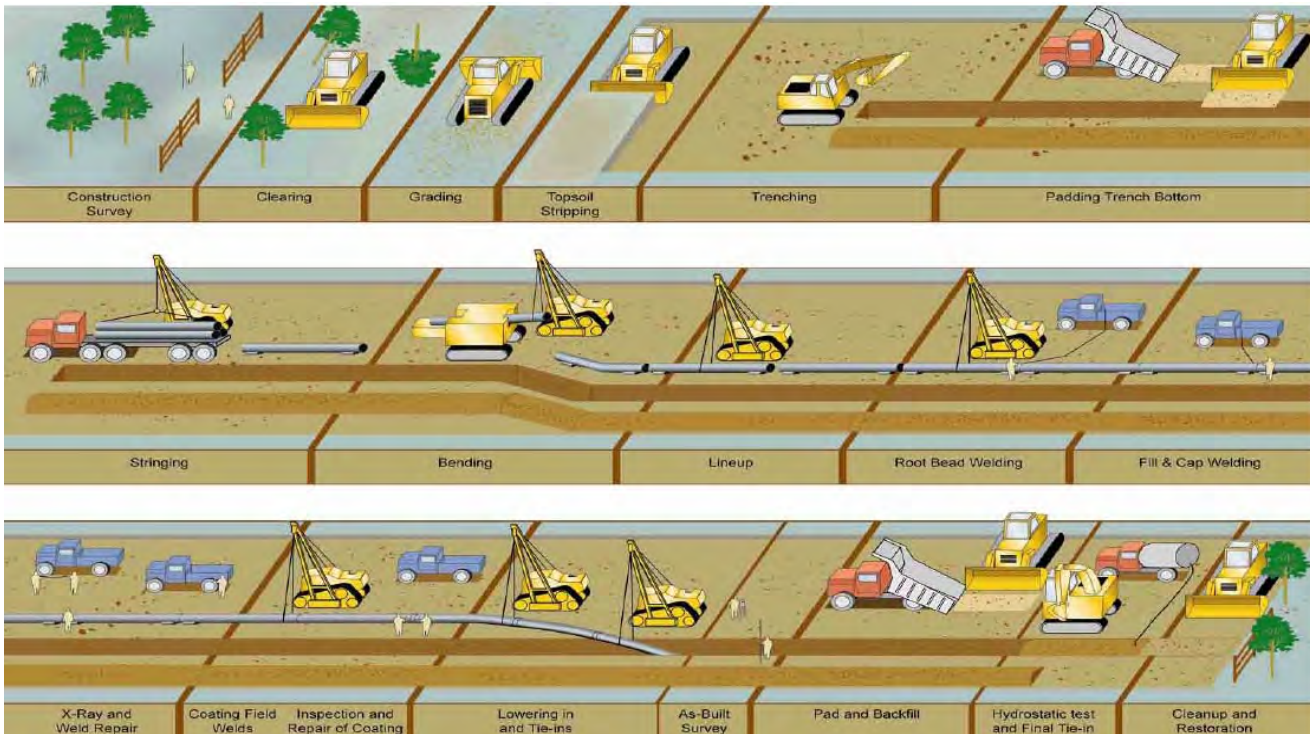


**FIGURE 1.** Arrow shows location of proposed Franklin Loop along the Leidy Southeast section of the Williams Transcontinental Pipeline in northern Pennsylvania. The system extends to the Gulf Coast.

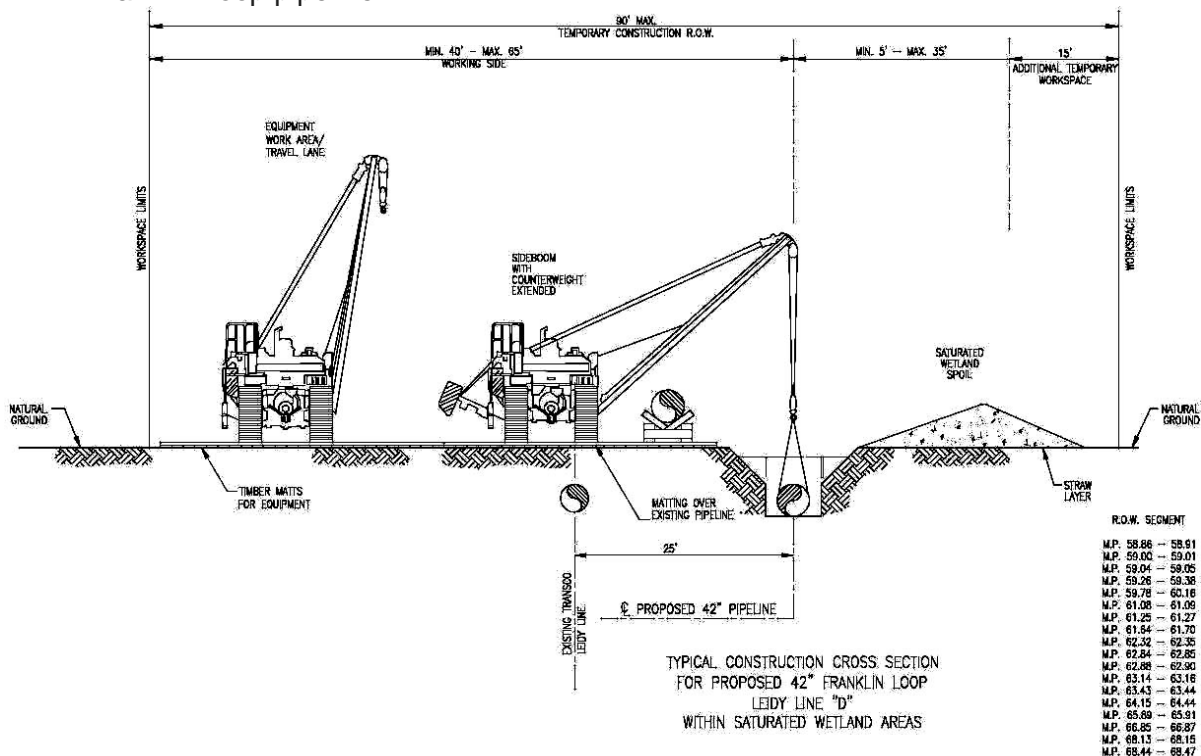
## SUMMARY OF PROPOSED IMPACTS ON WETLANDS, STREAMS, AND BUFFERS

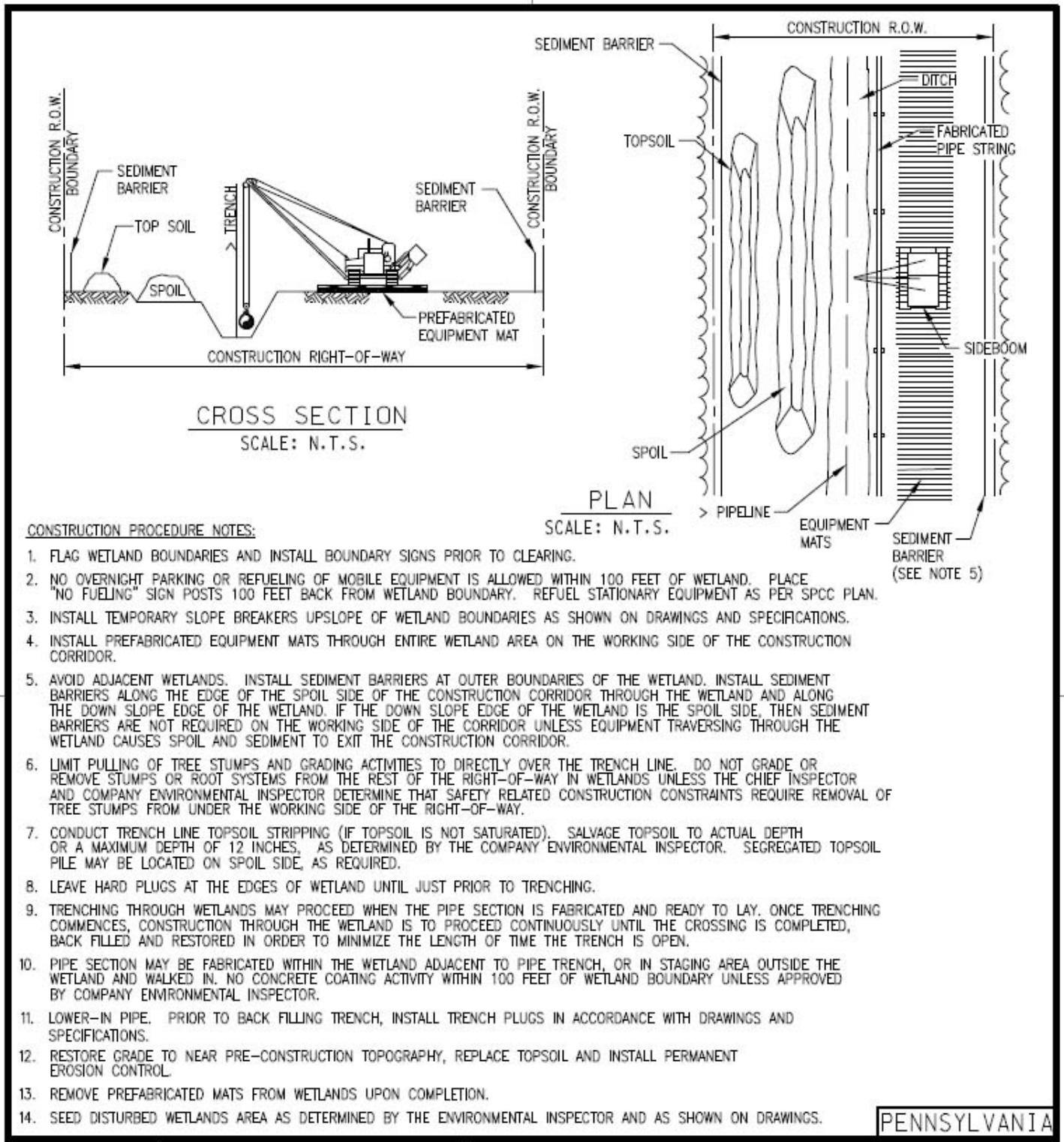
The study corridor for the Franklin Loop D Line is 300 feet wide and includes about 420 acres. The Applicant currently lists 49 numbered wetlands (58 separate polygons) encompassing 61.81 total wetland acres within the corridor (Table A). The Applicant's data continue to change as plans are revised and reviewed. For this discussion its 2013 application statements have been updated from its early 2014 data to the extent that such data were available, including March 2014 revised tables of expected wetland impact submitted to the Army Corps of Engineers with a request for Clean Water Act Section 404 permit approval. Figures 2 through 7 provide information on proposed typical construction and restoration procedures for this project along the Franklin Loop.

The Franklin Loop construction also will require construction or improvement of several access roads, which will entail unavoidable stream crossings but apparently no wetland impacts. All access roads are to be removed and their disturbed areas restored following Franklin Loop construction, according to the application text. In the event that approvals are granted for Franklin Loop construction, the permanent retention of any roadway improvements presumably would have to be authorized by permit modification.

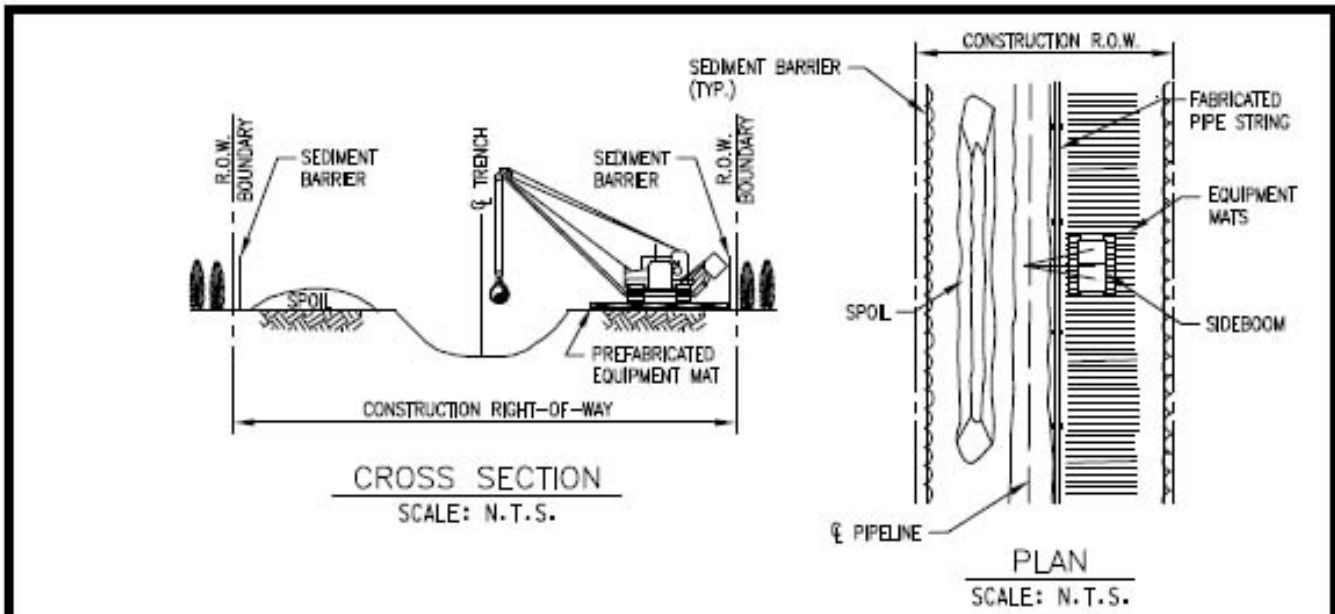


**FIGURE 2.** Typical construction sequence (above) and saturated wetland section (below) along the Franklin Loop pipeline.





**FIGURE 3.** Construction detail for "unsaturated wetland" pipeline installation.



**CONSTRUCTION PROCEDURE NOTES:**

1. FLAG WETLAND BOUNDARIES AND INSTALL BOUNDARY SIGNS PRIOR TO CLEARING.
2. NO OVERNIGHT PARKING OR REFUELING OF MOBILE EQUIPMENT IS ALLOWED WITHIN 100 FEET OF WETLAND. PLACE "NO FUELING" SIGN POSTS 100 FEET BACK FROM WETLAND BOUNDARY. REFUEL STATIONARY EQUIPMENT AS PER SPOC PLAN.
3. INSTALL TEMPORARY SLOPE BREAKERS UP SLOPE OF WETLAND BOUNDARIES AS SHOWN ON DRAWINGS AND SPECIFICATIONS.
4. INSTALL PREFABRICATED EQUIPMENT MATS THROUGH ENTIRE WETLAND AREA ON THE WORKING SIDE OF THE CONSTRUCTION CORRIDOR.
5. AVOID ADJACENT WETLANDS. INSTALL SEDIMENT BARRIERS AT OUTER BOUNDARIES OF WETLAND AND ALONG BOTH WETLAND EDGES.
6. LIMIT PULLING OF TREE STUMPS AND GRADING ACTIVITIES TO DIRECTLY OVER THE TRENCH LINE. DO NOT GRADE OR REMOVE STUMPS OR ROOT SYSTEMS FROM THE REST OF THE RIGHT-OF-WAY IN WETLANDS UNLESS THE CHIEF INSPECTOR AND COMPANY ENVIRONMENTAL INSPECTOR DETERMINE THAT SAFETY RELATED CONSTRUCTION CONSTRAINTS REQUIRE REMOVAL OF TREE STUMPS FROM UNDER THE WORKING SIDE OF THE RIGHT-OF-WAY.
7. TOPSOIL STRIPPING SHALL NOT BE REQUIRED IN SATURATED SOIL CONDITIONS.
8. LEAVE HARD PLUGS AT THE EDGES OF WETLAND UNTIL JUST PRIOR TO TRENCHING.
9. TRENCHING THROUGH WETLANDS MAY PROCEED WHEN THE PIPE SECTION IS FABRICATED AND READY TO LAY. ONCE TRENCHING COMMENCES, CONSTRUCTION THROUGH THE WETLAND IS TO PROCEED CONTINUOUSLY UNTIL THE CROSSING IS COMPLETED, BACK FILLED AND RESTORED IN ORDER TO MINIMIZE THE LENGTH OF TIME THE TRENCH IS OPEN.
10. PIPE SECTION MAY BE FABRICATED WITHIN THE WETLAND ADJACENT TO PIPE TRENCH, OR IN STAGING AREA OUTSIDE THE WETLAND AND WALKED IN. NO CONCRETE COATING ACTIVITY WITHIN 100 FEET OF WETLAND BOUNDARY, UNLESS APPROVED BY COMPANY ENVIRONMENTAL INSPECTOR.
11. LOWER-IN PIPE. PRIOR TO BACKFILLING, INSTALL TRENCH PLUGS IN ACCORDANCE WITH DRAWINGS AND SPECIFICATIONS.
12. RESTORE GRADE TO NEAR PRE-CONSTRUCTION TOPOGRAPHY AND INSTALL PERMANENT EROSION CONTROL.
13. REMOVE PREFABRICATED MATS FROM WETLANDS UPON COMPLETION.
14. SEED DISTURBED WETLAND AREA AS DETERMINED BY THE ENVIRONMENTAL INSPECTOR AND AS SHOWN ON DRAWINGS.

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DRAWING NO.		REFERENCE TITLE		TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC LEIDY SOUTHEAST PROJECT STANDARD ENVIRONMENTAL DETAIL TYPE I) "SATURATED WETLAND" INSTALLATION PROCEDURE						
NO.	DATE	BY	REVISION/DESCRIPTION	ISSUED	CHK.	APP.	DRAWN BY: <b>WGMI</b>	DATE: <b>8/8/13</b>	ISSUED FOR: <b>ISSUED FOR PER</b>	SCALE: <b>N.T.S.</b>
0	9/3/2013		ISSUED FOR SUBMITTAL		SB	MJH	CHECKED BY: <b>BB</b>	DATE: <b>9/18/13</b>	ISSUED FOR: <b>ISSUED FOR CONSTRUCTION</b>	
1	9/18/2013		ISSUED FOR FILING		SB	MJH	APPROVED BY: <b>MJH</b>	DATE: <b>9/18/13</b>	DRAWING NUMBER: <b>LS-TYP-0009PA</b>	SHEET <b>1</b>
								2-4pm	9/18/2013	OF <b>2</b>

FIGURE 4. Construction detail for "saturated wetland" pipeline installation.



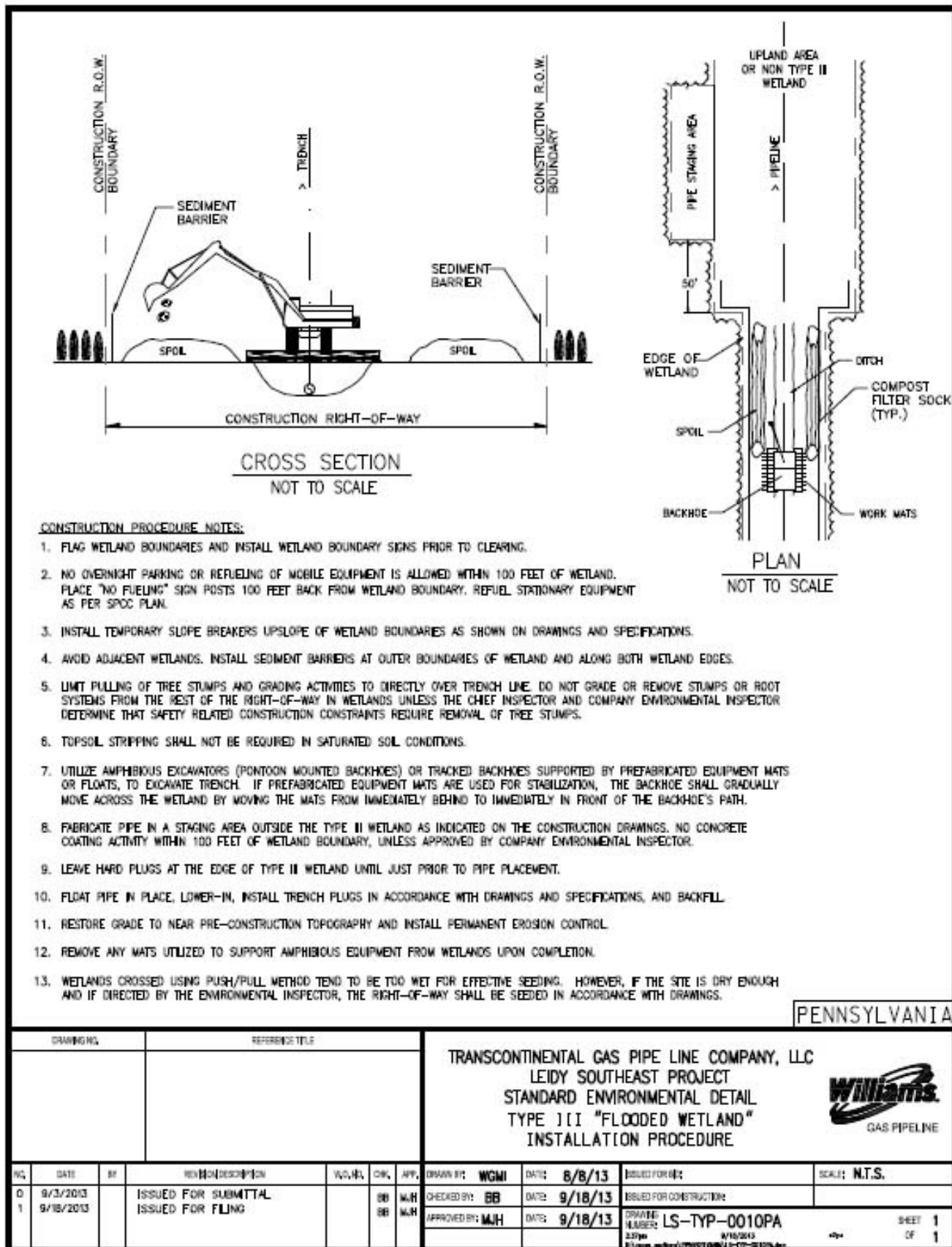


FIGURE 5. Construction detail for "flooded wetland" pipeline installation.

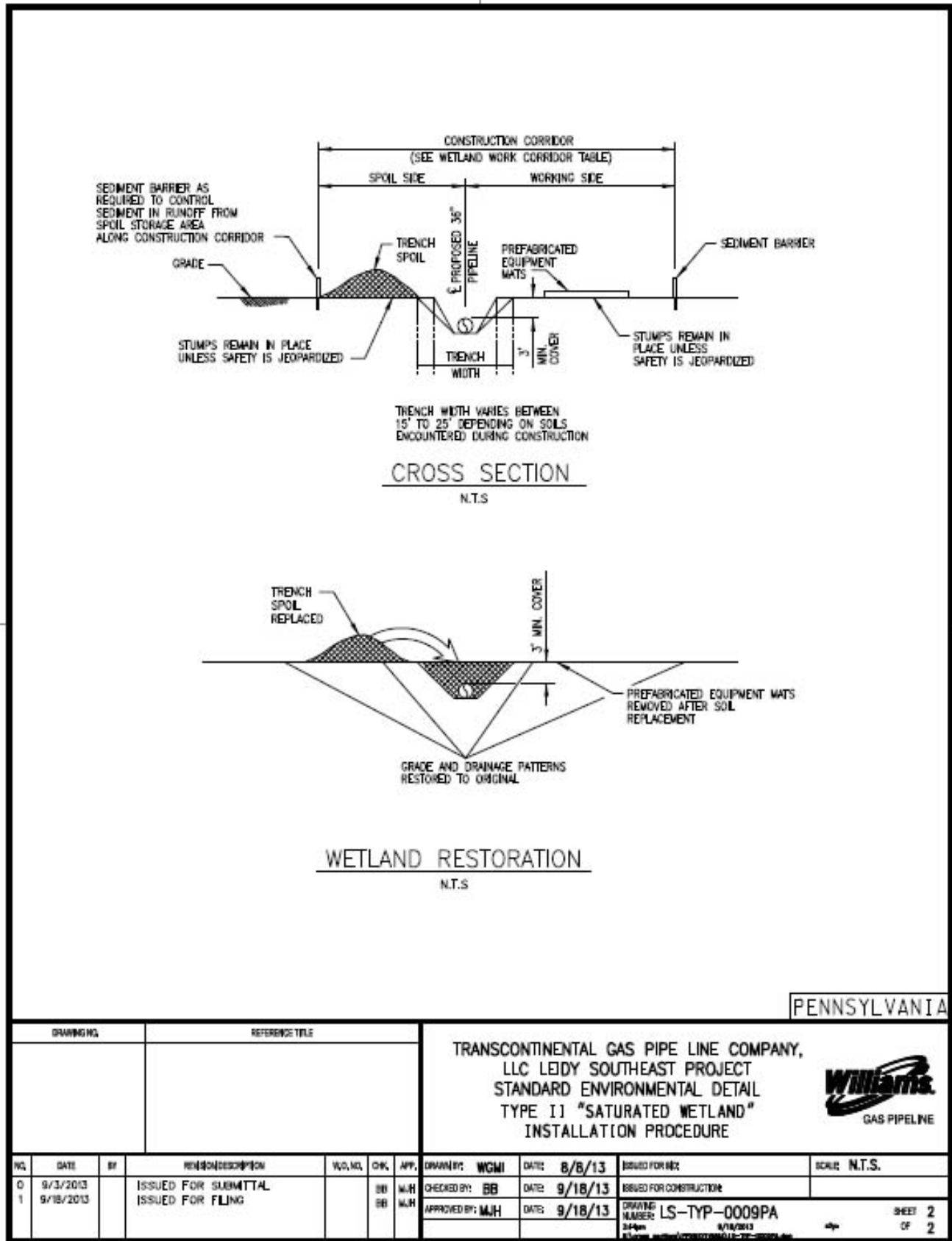
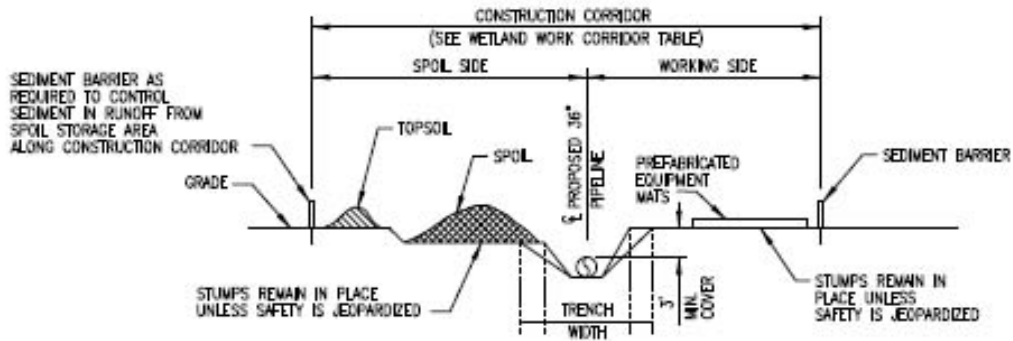


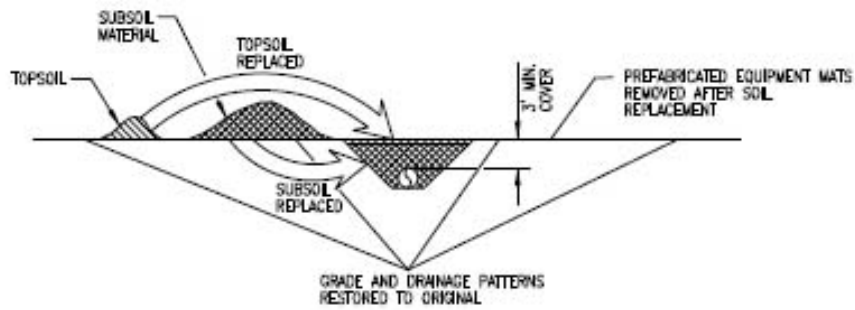
FIGURE 6. Construction detail for restoration of "saturated wetland" after pipeline installation.



TRENCH WIDTH VARIES BETWEEN 15' TO 25' DEPENDING ON SOILS ENCOUNTERED DURING CONSTRUCTION

**CROSS SECTION**


N.T.S.



**WETLAND RESTORATION**

N.T.S.

PENNSYLVANIA

DRAWING NO.		REFERENCE TITLE		TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC LEIDY SOUTHEAST PROJECT STANDARD ENVIRONMENTAL DETAIL TYPE I "UNSATURATED WETLAND" INSTALLATION PROCEDURE						
NO.	DATE	BY	REVISION/DESCRIPTION	W.D. NO.	CHK.	APP.	DRAWN BY: WGM	DATE: 8/8/13	ISSUED FOR: MEZ	SCALE: N.T.S.
0	9/3/2013		ISSUED FOR SUBMITTAL		BB	M.JH	CHECKED BY: BB	DATE: 9/18/13	ISSUED FOR CONSTRUCTION	
1	9/18/2013		ISSUED FOR FILING		BB	M.JH	APPROVED BY: M.JH	DATE: 9/18/13	DRAWING NUMBER: LS-TYP-0008PA	SHEET 2 OF 2

**FIGURE 7.** Restoration of "unsaturated wetland" after pipeline installation. No restoration drawing was provided for "flooded wetland" areas.

The Franklin Loop is to be constructed in accordance with some (but not all) of the Federal Energy Regulatory Commission's (FERC) May 2013 guidelines for wetland protection during the construction of regulated interstate pipelines. The 42-inch D pipe generally is to be placed no more than 25 feet from existing Leidy pipelines. The Applicant expects to need an extra 15 feet of Additional Temporary Work Space beyond the normally allowed FERC limit of 75 feet through wetlands for installation of the 42-inch pipeline in 7-foot deep trenches. It expects not to maintain the FERC-specified 15 feet of vegetation as a buffer between the construction ROW and any adjacent wetland or waterbody, and it intends to install the D pipeline parallel to five stream segments (rather than perpendicular, as per FERC standards) along the Franklin Loop.

Disturbance is proposed on 59.66 acres of land within the existing maintained easement and 144.58 new acres outside the existing maintained easement, for a total disturbance of 204.24 acres of land for the Franklin Loop. Stream crossings are planned as temporary disturbance at 33 currently acknowledged locations (plus at least two additional headwater streams not yet acknowledged), all in Special Protection waters having uses designated as Exceptional Value (EV) or High Quality-Cold Water Fishery, Migratory Fishery (HQ-CWF, MF). Waters in Pennsylvania with Exceptional Value designated uses are equivalent to Outstanding National Resource Waters in the language of the federal Clean Water Act (33 USC § 1251 *et seq.*; 40 CFR 131.12). Such waters are to receive the most stringent protection against degradation. High Quality waters also are to receive Special Protection beyond that afforded ordinary Pennsylvania streams.

The Applicant identifies direct impacts to 17.37 acres (28% of all the wetland acres it delineated in the study corridor, Table B). It plans construction within 36 numbered wetlands (some consisting of multiple polygons). The 2013 FERC guidelines call for onsite restoration, following the conclusion of interstate pipeline installation, of topography, drainage patterns, soil, and native wetland vegetation comparable to that impacted. The Applicant appears prepared to comply by restoring only about 13 acres of what it labels "temporary" wetland disturbance along the pipeline. Wetland forest regrowth will not be allowed in about 4.32 acres atop and adjacent to the new pipeline.

## **VEGETATION CONVERSION**

Based on remeasurement of the Applicant's February 2014 FERC alignment drawings (Figure 8), enlarged to a scale of 1:480 (1" = 40') for this assessment, the Applicant appears to propose permanent conversion from woody to herbaceous vegetation in 12 numbered wetlands totaling 6 acres (about 4.3 ac of Palustrine Forest [PFO] plus 1.7 ac of Palustrine Scrub [PSS] to become herbaceous vegetation [PEM], Table B). These totals contrast with the Applicant's statement in its 2013 Mitigation Plan (FERC Application Requirement T) that there would be only 3.84 acres of total conversion from woody to herbaceous vegetation in the Franklin Loop wetlands post-construction. For the Corps application the total forest conversion was listed as 4.07 acres. For this remeasurement the Applicant's "tree lines" on stream and wetland encroachment drawings, along with photographs and limited field inspection, were used to ascertain the extent of existing forest and scrub wetlands within proposed limits of disturbance by construction (Figures 8 and 9). The revised tallies of vegetation conversion reported here are consistent with data recorded by the Applicant's bog turtle consultant during 2013. The most detailed description of existing vegetation at each wetland in Monroe County is provided by the Applicant's bog turtle consultant, which is more accurate than that of the Applicant's summary impact tables. No bog turtle investigations were performed west of the Lehigh River in Luzerne County.

The permanent conversion of forest and scrub vegetation to herbaceous cover in wetlands along the pipeline is necessary because the Applicant plans to maintain a 10-foot wide corridor centered on the



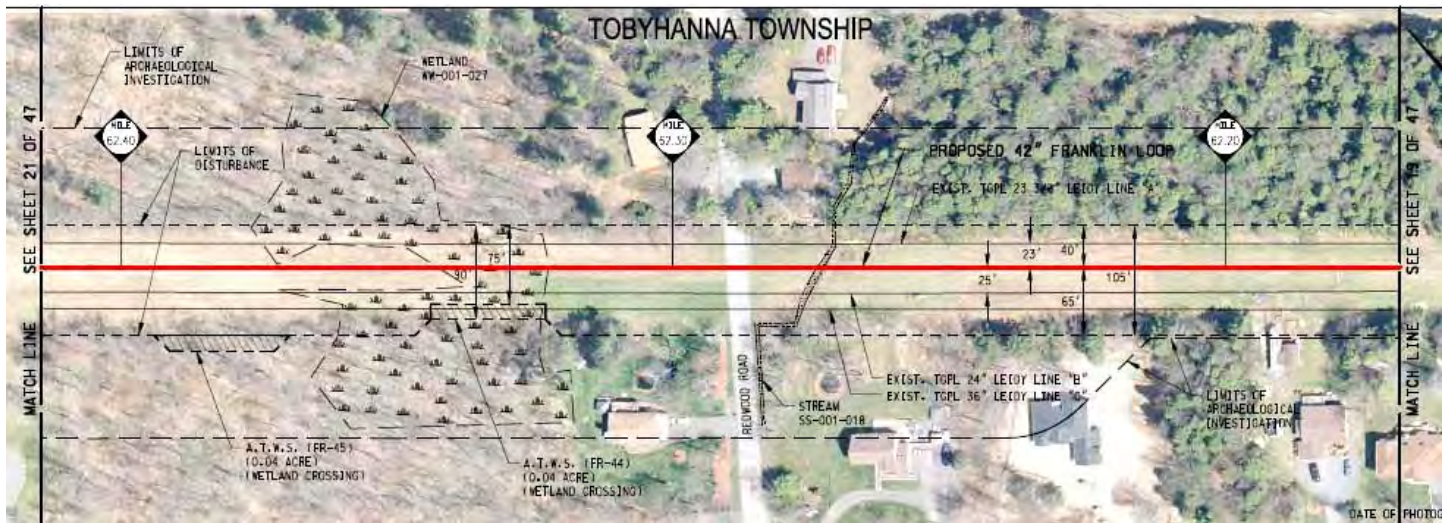


FIGURE 8. Sample from a February 2014 FERC alignment plan.

new pipeline free of woody vegetation and extending 20 feet in each direction to facilitate ongoing inspection. The new pipeline is to be installed alongside the existing pipelines, with several crossovers from one side of the existing ROW to the other. By measurement, the Applicant's plans

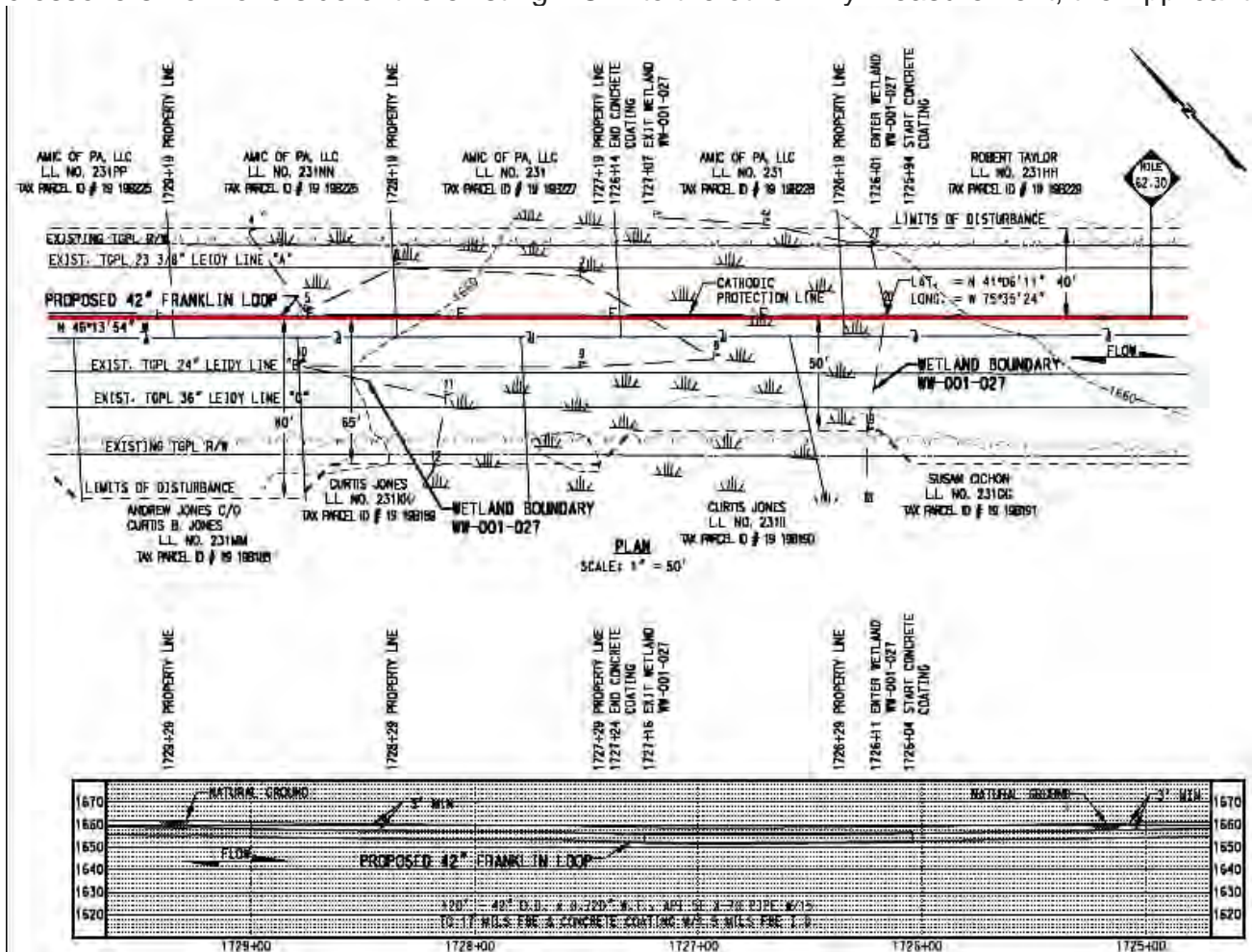


FIGURE 9. Sample from a February 2014 wetland obstruction plan drawing showing tree lines. Vegetation impact was remeasured from these drawings (after enlargement).

would “allow” 6.52 acres of "temporarily disturbed" wetland forest and 2.05 acre of wetland scrub to revegetate, along with 4.47 acres of "temporary disturbance" in emergent herbaceous vegetation along the Franklin Loop. That adds up to 17.37 acres of direct impact on existing wetlands, including the 4.33 acres of permanent woody wetland vegetation conversion to herbaceous cover. (Neither time nor access was available to check the applicant’s flagged wetland boundaries. Limited field inspection at several locations during May 2014 confirmed that the flagging generally appeared accurate within the proposed construction corridor.)

Such changes in vegetation, whether “temporary” or permanent, will constitute a profound change of habitat for wildlife in natural areas such as occupy much of the surroundings of the Franklin Loop. Surface runoff from vegetated land disturbed by construction typically increases. Compaction of soils by construction equipment also can alter its permeability, reducing both the amount of groundwater infiltration and the capacity of plants to establish roots post-construction. As a result, current groundwater recharge and discharge can be altered. The Applicant proposes to install trench plugs along the pipeline to prevent the pipeline from forming a drainage route capable of major alteration of hydrology. The applicant proposes to minimize invasion by non-native plants into disturbed areas.

When the species of wetland plants are altered in response to changes in soil or wetness of species introductions, the chemistry of leaf litter changes, its mass and volume can decrease, and these changes in turn alter the food webs that can be supported (Stoler & Relyea 2011). Denitrification, the conversion of nitrogen compounds to inert nitrogen gas, is a major natural process that takes place in wetland soils. Beneath forests, denitrification apparently occurs primarily in patches of accumulated organic matter, often in depressions associated with wind throw of trees, at rates that vary with tree species (e.g., Rotkin-Ellman *et al.* 2004, Jacinthe *et al.* 2003, Gold *et al.* 1998). The conversion of forest or scrub to herbaceous wetlands can affect the denitrification function in complex ways, thereby affecting the quality of groundwater and surface waters.

If herbicides are used for vegetation maintenance, they may directly affect wetland plants and animals other than the target species. The Applicant has not detailed the functions of individual wetlands along the Franklin Loop or explained how mitigation for what it considers unavoidable disruption will be accomplished except by the gross quantitative ratios based on early measurements of less total direct wetland acreage impacts mentioned in its plan for offsite wetland mitigation.

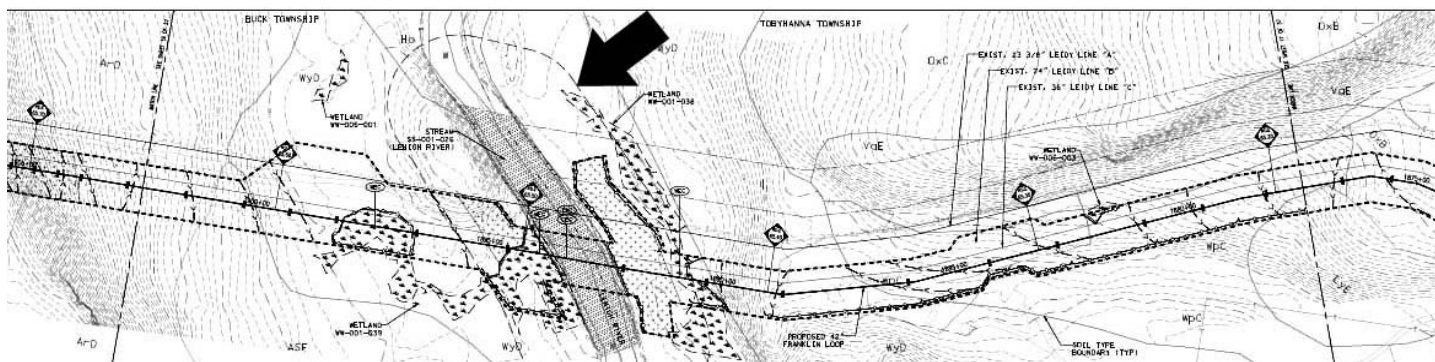
## **DAMAGE TO BUFFERS**

The Applicant quantifies the extent of its proposed construction within bordering uplands (non-wetlands) adjacent to the directly disturbed wetlands and streams that comes closer than the 50-foot wide undisturbed buffer anticipated by FERC around all such features. The Applicant’s Table A-2 in its Appendix A1 lists 43 proposed encroachments ranging from 10 to 50 feet into standard FERC non-wetland buffers around delineated wetlands. These encroachments will occupy 7.31 acres. Table A-1 in the applicant’s Appendix A1 lists 17 additional encroachments into FERC stream buffers ranging from 15 to 50 feet into riparian setbacks around streams. These encroachments will occupy 3.99 acres adjacent to the 1.1 acres of directly impacted stream channels at 33 of the 35 proposed stream crossings affecting more than 4,128 linear feet of streams. It is not clear that all of these proposed encroachments into buffers are unavoidable. The Applicant states that it plans to preserve 15 feet of vegetation along streambanks “where possible,” but it does not indicate the locations of such areas on its drawings. It also plans to stockpile excavated materials no closer than 10 feet to the water’s edge of streams. It is difficult to understand why the applicant proposes additional temporary workspace next to EV streams even where there appears to be ample already

disturbed land available within the existing ROW, as for example along the east bank of the Lehigh River (northwest of Mile Post 65.40; Figure 10). Concrete coatings are not to be applied to pipes within 100 feet of streams or wetlands, and vehicle parking and refueling also are to be kept back 100 feet per FERC guidelines.

Pennsylvania now requires that mandatory riparian buffers be deed-restricted and maintained or (if lacking) installed by planting native trees and shrubs along all Special Protection rivers, streams, lakes, and ponds (those designated for either Exceptional Value or High Quality uses) wherever construction activities are proposed that need Erosion and Sediment Control plan approval for earth disturbance within 150 feet of those watercourses (25 Pa. Code 102.14). Forested riparian buffers are identified by PADEP (2010) as the single most important and effective Best Management Practice that can be provided for streams and other watercourses throughout the Commonwealth. The 150-foot wide buffer limit is shown around all Applicant-recognized streams (but no ponds, inexplicably) on the Applicant's draft soil erosion and sediment control drawings (for example, the dashed line around the affected segment of the Lehigh River in Figure 10). There are no drawings showing permanent post-construction stormwater management features at all, as required in Pennsylvania Chapter 102 permit applications, so it is not possible to determine whether or where the applicant proposes to restore any riparian buffers. No measures are shown to make certain that surface runoff entering the riparian buffers will consist solely of non-erosive sheet flow post-construction.

Within Special Protection watersheds, such as *all* the land crossed by the Franklin Loop, the restricted riparian buffers post-construction are required to be 150 feet wide as measured horizontally from the stream bank or normal pool edge. In the 50 feet closest to the watercourse (Zone 1), the native trees, shrubs, and herbaceous forbs must remain undisturbed in the future; management such as sustainable timber harvest may be conducted within the outer 100 feet of the forest buffer (Zone 2) in accordance with a State-approved buffer management plan. The riparian buffers are required to be established by easement, deed restriction, or other enforceable measure reciting the future human and livestock activities prohibited, authorized, or requiring specific PADEP management plan approval. The management measures and responsible parties that will ensure buffer integrity and long-term functioning also must be identified. No such information appears in the current application. It is unlikely that forested riparian buffers can be maintained where the pipeline permanently is to be kept free of woody vegetation. No buffer restoration narrative was provided, so the applicant's plans for riparian buffers remain unknown.

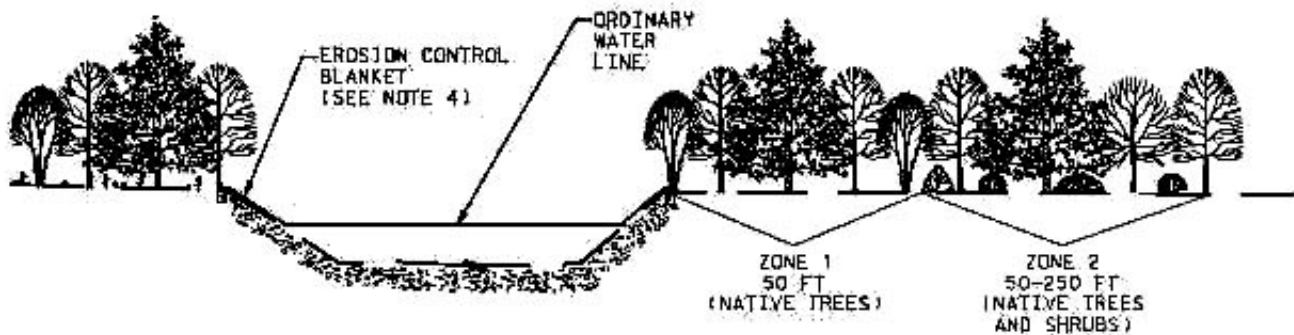


**FIGURE 10.** Excerpt from soil erosion and sediment control plan showing proposed measures for use during construction. No post-construction stormwater management plan has been submitted. Applicant's dashed 150-foot wide forest riparian buffer around disturbed stream segment is indicated by arrow.

In order to comply with the Chapter 102 buffer requirements, the 33 acknowledged stream crossings that will directly affect 8,276 feet of streambanks would require conservation easements for 28.5 acres of permanently protected, forested riparian buffers at the minimum width of 150 feet. At least two more streams cross the ROW (as described below) for which buffers need to be added to these totals. Buffer establishment also will be needed for other riparian lands not crossed by the pipeline, wherever earth disturbance is planned for this pipeline within 150 feet of streams or ponds. Typical details for buffer restoration are provided in Figures 11 through 15, but no plan is provided showing where any of these buffers might be placed post-construction. PADEP regulations anticipate the possibility of approving offsite riparian buffers, which possibly might prove practicable for at least some of the mandatory stream buffer mitigation needed for new pipelines such as the Franklin Loop. The applicant has not addressed this issue.

Existing ponds along the ROW have not been identified on the Applicant's drawings and also will require riparian buffer replacement for any earth disturbance within 150 feet. (The Applicant's definition of waterbodies includes only streams.) These additional earth disturbances will require several more acres of additional easements and riparian buffer establishment beyond the 28.5 acres of mitigation for direct riparian buffer impact at stream crossings. PADEP (2010) has prepared technical guidance for both legal protection and landscape planting to establish the mandatory riparian buffers where earth disturbance is authorized within 150 feet of Special Protection watercourses. The Applicant does not mention any plans for 5-year minimum monitoring and reporting of buffer restoration success as required by Pennsylvania regulations.



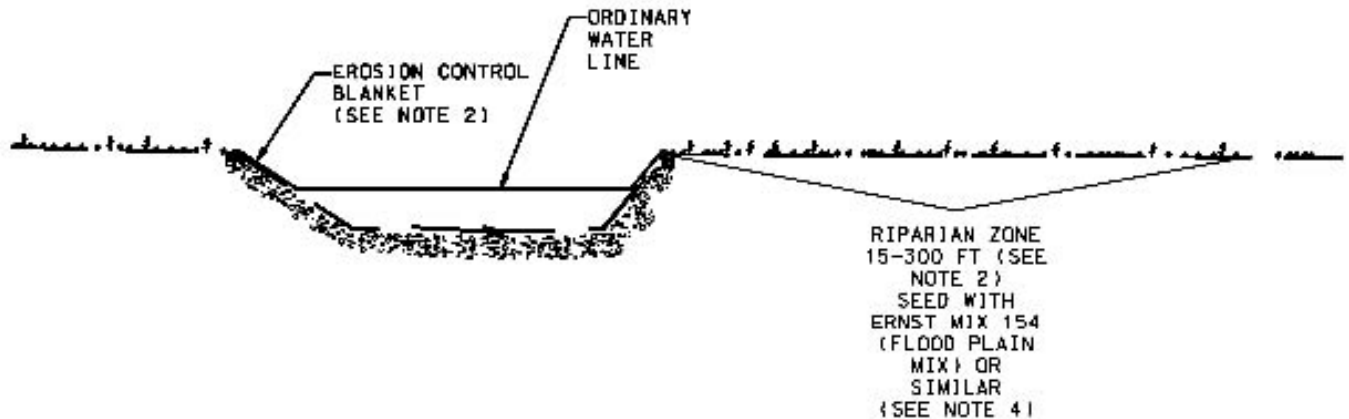


**NOTES:**

1. RESTORE IMPACTED FOREST BUFFER FOR:  
150 FT (HIGH QUALITY WATERS - PA)  
100 FT (OTHER WATERS - PA)  
OR EXISTING WIDTH OF FOREST BUFFER, IF LESS THAN THESE MINIMUM REQUIREMENTS.
2. ZONE 1 AND ZONE 2 PLANTING AREAS ARE RECOMMENDED FROM PADEP RIPARIAN FOREST BUFFER GUIDANCE (DOCUMENT NUMBER 394-5600-001, NOVEMBER 27, 2010).
3. NATIVE TREES AND/OR SHRUBS IN ZONE 1 AND ZONE 2 SHOULD BE PLACED 12' APART.
4. EROSION CONTROL BLANKETS SHALL BE PLACED ON RESTORED BANKS TO THE ORDINARY WATER LINE AND IN UPLAND AREAS SHOULD BE INSTALLED A MINIMUM OF 50 FT BEYOND THE TOP OF BANK (MORE AS NEEDED DEPENDING ON SLOPES). EROSION CONTROL BLANKETS SHALL NOT BE PLACED IN WETLANDS. SEE DETAIL ON SHEET 22.
5. ERNST MIX 178 (RIPARIAN BUFFER MIX) OR SIMILAR TO BE APPLIED AT 20 LBS PER ACRE OR 1/2 LB PER 1,000 SQ. FT. ON RESTORED BANKS AND IN ZONE 1 AND ZONE 2.
6. FOR DETAILS REGARDING RECOMMENDED TREES, SHRUBS, LIVE STAKES AND SEED MIX SEE TABLES 1 AND 2 ON THIS SHEET.
7. LIVE STAKES SHOULD BE PLANTED ALONG WATER BODY BANKS WITH EXISTING WOODY VEGETATION.
8. NO TREES ARE TO BE PLANTED IN AN AREA 10 FEET WIDE CENTERED OVER THE PIPE LINE.

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**FIGURE 11.** Detail for typical restoration of native forest riparian buffers along streams. No drawing shows where such buffers will be installed along the Franklin Loop. There are no "other waters" along the Franklin Loop. The drawings apply also to the Dorrance Loop of the Leidy Southeast pipeline.

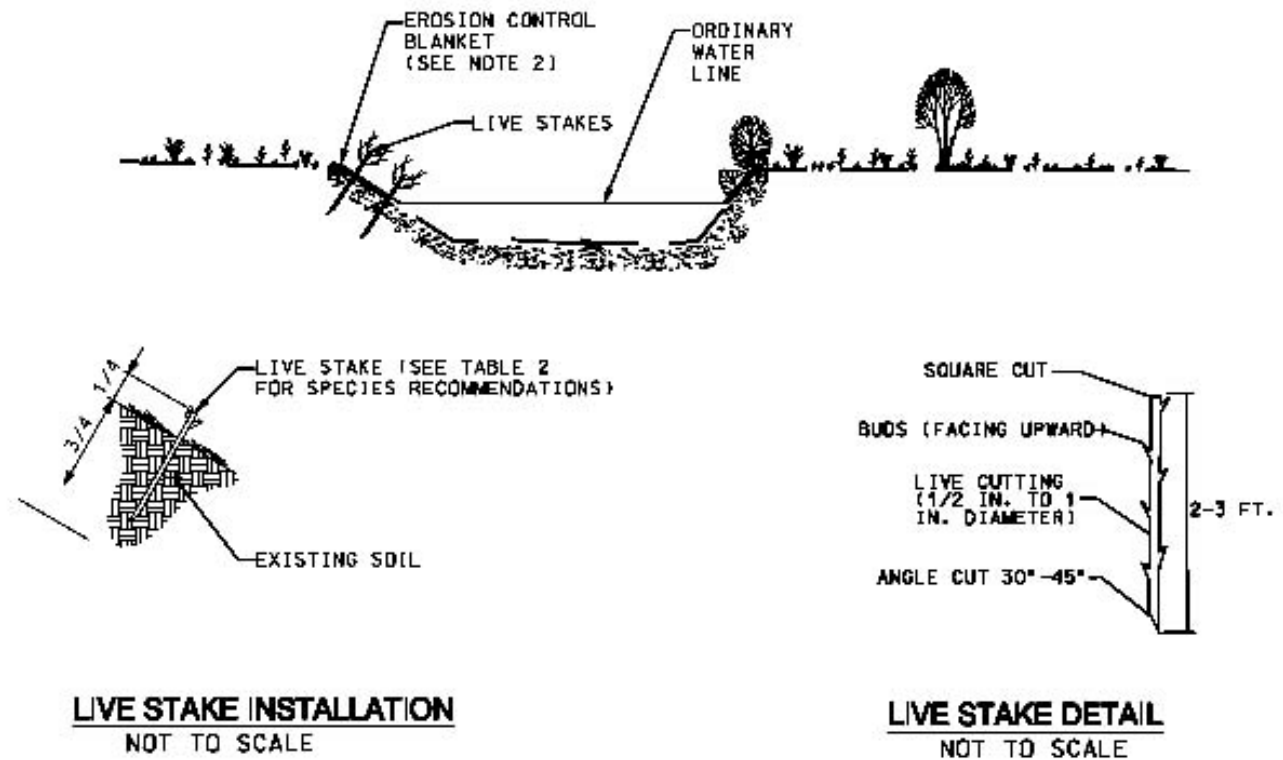


**NOTES:**

1. RESTORE IMPACTED RIPARIAN ZONE FOR A MINIMUM OF 15 FEET LANDWARD OF THE TOP OF BANK. IF THE PRE-IMPACT RIPARIAN BUFFER OF NATIVE HERBACEOUS AND SHRUB VEGETATION EXCEEDS 15 FEET BEYOND THE TOP OF BANK, THE AREA TO BE SEEDED SHOULD BE AS FOLLOWS:  
     150 FT (HIGH QUALITY WATERS - PA)  
     100 FT (OTHER WATERS - PA)  
     OR EXISTING WIDTH OF RIPARIAN ZONE IF LESS THAN THESE MINIMUM REQUIREMENTS.
2. EROSION CONTROL BLANKETS SHALL BE PLACED ON RESTORED BANKS TO THE ORDINARY WATER LINE AND UPLAND AREAS SHOULD BE INSTALLED A MINIMUM OF 50 FT BEYOND THE TOP OF BANK (MORE AS NEEDED DEPENDING ON SLOPES). EROSION CONTROL BLANKETS SHALL NOT BE PLACED IN WETLANDS. SEE DETAIL ON SHEET 22.
3. ERNST MIX 154 (FLOOD PLAIN MIX) OR SIMILAR TO BE APPLIED AT 15 LBS PER ACRE OR 1/3-1/2 LB PER 1,000 SQ. FT. ON RESTORED BANKS AND IN RIPARIAN ZONE.
4. FOR DETAILS REGARDING RECOMMENDED SEED MIX, SEE TABLE 1 ON THIS SHEET.
5. LIVE STAKES SHOULD BE PLANTED ALONG WATER BODY BANKS WITH EXISTING WOODY VEGETATION.

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**FIGURE 12.** Detail for typical non-forest riparian buffer to be installed along the Franklin Loop. Pennsylvania regulations call for installation of forest in riparian zones wherever they currently are lacking (25 Pa. Code 102.14). The relevance of this detail to the Franklin Loop is not clear. No drawing shows where such buffers will be located



**NOTES:**

1. THIS DETAIL IS FOR THE STABILIZATION OF WATER BODIES WITH EXISTING WOODY VEGETATION ALONG THE BANKS AND SHOULD BE COMBINED AS NEEDED WITH THE OTHER VEGETATION RESTORATION OPTIONS.
2. EROSION CONTROL BLANKETS SHALL BE PLACED ON RESTORED BANKS TO THE ORDINARY WATER LINE AND IN UPLAND AREAS SHOULD BE INSTALLED A MINIMUM OF 50 FT BEYOND THE TOP OF BANK (MORE AS NEEDED DEPENDING ON SLOPES). EROSION CONTROL BLANKETS SHALL NOT BE PLACED IN WETLANDS. SEE DETAIL ON SHEET 22.
3. TWO ROWS OF LIVE STAKES SHALL BE EVENLY SPACED 2 FEET APART.
4. LIVE STAKES SHALL BE DRIVEN UNTIL APPROXIMATELY 3/4 OF THE LIVE STAKE IS WITHIN THE GROUND.
5. IF STARTER HOLE IS NEEDED, MINIMIZE AIR POCKET.
6. AVOID STRIPPING THE BARK OR BRUISING OF STAKES DURING INSTALLATION. DO NOT USE AXE OR SLEDGE FOR DRIVING STAKES. IN HARD GROUND USE AN IRON BAR OR STAR DRILL TO PREPARE HOLES FOR THE STAKES.

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**FIGURE 13.** Detail for typical live stake installation in buffers along streams. No drawing shows where such buffers will be installed along the Franklin Loop.

<b>TABLE 2 - RECOMMENDED NATIVE TREE, SHRUB AND LIVE STAKE SPECIES</b>				
<b>ZONE 1 (50 FEET WIDE)</b>				
<b>SCIENTIFIC NAME</b>	<b>COMMON NAME</b>	<b>PLANT FORM</b>	<b>SPACING (FEET)</b>	<b>SIZE / CONTAINER</b>
ACER SACCHARUM	SUGAR MAPLE	TREE	12	#1
BETULA ALLEGHANIENSIS	YELLOW BIRCH	TREE	12	#1
BETULA LENTA	BLACK BIRCH	TREE	12	#1
LIRIODENDRON TULIPIFERA	TULIP POPLAR	TREE	12	#1
QUERCUS ALBA	WHITE OAK	TREE	12	#1
QUERCUS RUBRA	RED OAK	TREE	12	#1
QUERCUS VELUTINA	BLACK OAK	TREE	12	#1
PINUS STROBUS	WHITE PINE	TREE	12	#1
TSUGA CANADENSIS	EASTERN HEMLOCK	TREE	12	#1
<b>NOTES:</b>				
1. IF EXISTING FORESTED RIPARIAN BUFFER IS LESS THAN 60 FEET WIDE, NATIVE TREES SHOULD BE PLANTED TO THE EXTENT OF THE EXISTING FORESTED RIPARIAN BUFFER.				
2. USE 12-FOOT SPACING FOR ALL TREES AND SHRUBS.				
<b>ZONE 2 (50 TO 250 FEET WIDE)</b>				
<b>SCIENTIFIC NAME</b>	<b>COMMON NAME</b>	<b>PLANT FORM</b>	<b>SPACING (FEET)</b>	<b>SIZE / CONTAINER</b>
ACER SACCHARUM	SUGAR MAPLE	TREE	12	#1
BETULA ALLEGHANIENSIS	YELLOW BIRCH	TREE	12	#1
BETULA LENTA	BLACK BIRCH	TREE	12	#1
LIRIODENDRON TULIPIFERA	TULIP POPLAR	TREE	12	#1
QUERCUS ALBA	WHITE OAK	TREE	12	#1
QUERCUS RUBRA	RED OAK	TREE	12	#1
QUERCUS VELUTINA	BLACK OAK	TREE	12	#1
PINUS STROBUS	WHITE PINE	TREE	12	#1
TSUGA CANADENSIS	EASTERN HEMLOCK	TREE	12	#1
CORNUS SP.	DOGWOOD	SHRUB	12	#1
GAYLUSSACIA SP.	HUCKLEBERRY	SHRUB	12	#1
KALMIA LATIFOLIA	MOUNTAIN LAUREL	SHRUB	12	#1
LINDERA BENZOIN	SPECIEBUSH	SHRUB	12	#1
RHOODODENDRON SP.	RHOODODENDRON	SHRUB	12	#1
VACINIUM SP.	BLUEBERRY	SHRUB	12	#1
VIBURNUM SP.	ARROWWOOD	SHRUB	12	#1
<b>NOTES:</b>				
1. THE WIDTH OF ZONE 2 WILL VARY DEPENDING ON THE LOCATION OF THE WATER BODY (PA VS. NJ), THE SURFACE WATER CLASSIFICATION (SEE TABLE II.1 IN RESTORATION NARRATIVE) AND THE WIDTH OF THE EXISTING FORESTED RIPARIAN BUFFER.				
2. IF THE EXISTING FORESTED RIPARIAN BUFFER IS LESS THAN THE MINIMUM REQUIRED WIDTH BASED ON TABLE II.1, NATIVE TREES AND SHRUBS SHOULD BE PLANTED TO THE EXTENT OF THE EXISTING FORESTED RIPARIAN BUFFER.				
<b>LIVE STAKES</b>				
<b>SCIENTIFIC NAME</b>	<b>COMMON NAME</b>	<b>PLANT FORM</b>	<b>SPACING (FEET)</b>	
SALIX SP.	WILLOW	LIVE STAKE	2	
CORNUS SP.	DOGWOOD	LIVE STAKE	2	
<b>NOTES:</b>				
1. LIVE STAKES SHOULD BE PLANTED ONLY ALONG WATER BODY BANKS WITH EXISTING WOODY VEGETATION.				
2. LIVE STAKES SHOULD BE PLANTED IN THE DORMANT SEASON BETWEEN NOVEMBER AND APRIL. ROOTED CUTTINGS OR CONTAINERIZED PLANTS OF SALIX AND CORNUS SPECIES SHOULD BE PLANTED IN PLACE OF LIVE STAKES BETWEEN MAY AND OCTOBER.				

FIGURE 14. Kinds and density of trees and shrubs to be planted in Franklin Loop buffers. Only container size (#1 = 1 gallon) is indicated; size of plants is not specified as required by ANSI Z60.1-2004. PADEP (2010) recommends planting hardwood trees (not conifers) and shrubs on 10-foot centers, 435 per acre, in riparian buffers.



TABLE A - PERMANENT VEGETATION		
SPECIES	APPLICATION RATES (LBS/AC)	RECOMMENDED APPLICATION DATES
BIRDFOOT TREFOIL, PLUS TALL FESCUE	8 39	MARCH 1 - NOVEMBER 15
FERTILIZER / SOIL SUPPLEMENT:		
AGRICULTURAL GRADE LIMESTONE	2,000	PRIOR TO SEEDING
FERTILIZER	100-200-200	PRIOR TO SEEDING

TABLE B - TEMPORARY VEGETATION		
SPECIES	APPLICATION RATES (LBS/AC)	RECOMMENDED APPLICATION DATES
ANNUAL RYEGRASS	40	MARCH 1 - NOVEMBER 15
WINTER RYE	168	NOVEMBER 16 - FEBRUARY 28
FERTILIZER / SOIL SUPPLEMENT:		
AGRICULTURAL GRADE LIMESTONE	2,000	PRIOR TO SEEDING
FERTILIZER	100-200-200	PRIOR TO SEEDING

**FIGURE 15.** Proposed measures for soil stabilization along the Franklin Loop.

## WETLAND FUNCTIONS

The Applicant does not specifically identify any significant reduction of wetland functions expected to result from its construction activity in close proximity to the wetlands, as well as from the work within the wetlands themselves along the Franklin Loop, except for reduction of infiltration to groundwater and increased sedimentation of surface waters. The Applicant deems the potential for soil compaction here to be insignificant, and offers no mitigation for it. It does not, however, propose any post-construction soil density testing to assure favorable density for revegetation. The Applicant lists certain Best Management Practices it intends to use to reduce erosion and sedimentation into buffers and remaining wetlands during pipeline construction and shows them on its draft drawings. There are no drawings in this application, however, that show (1) post-construction conditions in the ROW, or (2) where the minimum permanently clear zones recommended by FERC or those currently proposed would be located for the Franklin Loop D and other Leidy Southeast pipelines in this ROW, or (3) where the mandatory riparian buffers will be established.

The Applicant did not address wetland functions as specified in 25 Pa. Code 105.13(d)(3). From careful examination of the locations and reported characteristics of wetlands proposed for impact, Table C was prepared to classify the significance of proposed impacts on wetland functions. The seriousness of the impacts appears to differ from wetland to wetland along the ROW. On the basis of available information, six classes of impact were distinguished to identify the severity of proposed damage. The following paragraphs discuss each class of proposed impact, and to the extent possible from limited available information, the basis for determining the probable severity of impacts on each wetland.

The success of functional recovery will depend on the ability of the Applicant to reestablish pre-construction conditions within the ROW. The minimum time required for recovery of functions will depend in part on the size and quantity of any plant materials installed by the Applicant. No time estimates were provided by the Applicant for anticipated natural revegetation by wild scrub and forest vegetation in the restored wetlands, where the Applicant proposes no plantings beyond soil stabilization seeding.

### **FUNCTIONAL DAMAGE SIGNIFICANCE, BY WETLAND**

Wetlands in the Franklin Loop are grouped here into six categories to facilitate concise discussion. The groups range from least significant to most significant according to apparent damages that will result to wetland functions. This discussion of impacts is based on the Applicant's FERC alignment drawings and tables dated February 2014, supplemented by other information in its 2013 application to PADEP and its 2014 application to the Philadelphia District, Army Corps of Engineers.

In general, the Applicant has provided no wetland-by-wetland justification text that demonstrates avoidance or minimization of proposed impacts. It is evident that the Applicant has sought to reduce in various places the extent of clearing additional ROW so as to confine direct wetland impacts of the Franklin Loop in various places to a construction corridor no wider than 75 feet. The new Franklin Loop pipe D is to cross from one side of existing Leidy pipelines to the other and in places to run between the existing Leidy Southeast pipelines to reduce its proximity to existing residences. No additional engineering assessment of possible further reduction of impacts has been made for this discussion. No horizontal directional drilling currently is proposed to minimize potential damages to major streams or large wetlands along the Franklin Loop.

The Applicant included no wetland-by-wetland analysis of wetland functions in its application, only tabulated acreages of anticipated damage. About 15 of the delineated wetlands, representing about 3.5 acres of direct wetland impact along the Franklin Loop ROW, appear already to have reduced ability to perform natural habitat functions because of adjacent human disturbance such as industrial (pipeline) installation and maintenance activities or nearby residential development, chiefly in the community of Blakeslee.

The following discussion assumes that all wetlands have been delineated accurately by the Applicant's consultant. A request for preliminary Jurisdictional Determination (JD) was to have been sought by the Applicant from the Philadelphia District of the Army Corps of Engineers during 2013, but there is no reference to any issued JD, and no revision of wetland boundaries was noted in the February 2014 revision of alignment drawings. Several ponds along the ROW have not been identified as such on the Applicant's drawings. At least two streams are not shown on the Applicant's drawings. One is an unnamed tributary to Two Mile Run about 300 feet northwest of SS-001-018 within WW-001-027; the other stream is adjacent to WW-007-007. Two very small wetlands near WW-001-031 were omitted from the Applicant's drawings, but are outside the proposed construction corridor.

All streams and wetlands in Pennsylvania are regulated in accordance with the Clean Streams Law, whether or not they are subject to federal jurisdiction as Waters of the United States. Complete soil erosion and sediment control plans were not available for this review, although draft plans were provided with the application. This discussion assumes that the Applicant plans to maintain a 20-foot wide corridor free of woody plants on each side of the proposed Franklin Loop 42" pipe although there is no drawing that shows these clear zone limits, post-construction reclamation or stormwater management plans, or mandatory riparian buffer establishment locations.

### **Category 1. Unjustified Damage**

It is reasonable to expect that the new pipeline itself will encounter some wetlands and wetland buffers, given the number and extent of wetlands along the existing Leidy pipelines ROW. It clearly is impossible both to site the new line alongside the existing lines, as preferred by FERC, and to avoid the existing wetlands that exist there, unless the entire pipeline were to be installed beneath the wetlands by horizontal boring. Boring beneath wetlands and streams has been rejected by the Applicant as a construction practice along the Franklin Loop, although it would appear most appropriate for forested WW-001-036, for WW-001-028 (especially considering the planned boring beneath adjacent Interstate 80), for WW-001-020 and 001-019, for WW-001-016 and 001-014, and for the Lehigh River (SS-001-026).

The Applicant has listed some justification for expanded temporary work areas within FERC buffers to facilitate practical construction activities in its Tables A-1 and A-2 in its Appendix A. The Applicant failed, however, to provide any justification for what appears to be permanent encroachment into four small wetlands at the extreme edges of its property at compressor stations (Figure 16) and a pipe storage yard away from the new pipeline itself: **WW-007-006, 007-007, 006-004, and 013-001**. Three of these wetlands appear to be hydrologically isolated from surface watercourses by intervening uplands (all but WW-007-007).

It would appear that these four wetlands could be avoided entirely, rather than converted temporarily or permanently to uplands with complete destruction of their wetland functions. The draft soil erosion control plan in fact shows sediment controls around WW-006-004, SS-009-002, and SS-009-001, as if these features were to remain undisturbed. It is difficult to envision successful restoration of functions in these wetlands following pipeline construction. Three would be isolated from natural vegetation and other wetlands. Instead, three of them probably could be surrounded by a 50-foot wide setback against new construction activities as advocated in the FERC guidelines, with no significant impediment to the proposed construction. (At WW-007-006 the adjacent land already is being used for pipe laydown and for roadways at the Applicant's Mount Effort Pipe Storage Yard, Figure 17, but most of this wetland is outside the proposed limit of new disturbance.) Wetland WW-007-007 is adjacent to an unrecognized streamcourse (Figure 18).

Eliminating encroachment into these four wetlands would eliminate the probable direct temporary or permanent conversion of wetlands to uplands by a total of 0.20 acre. Preservation of buffers would further reduce the indirect impacts of nearby construction on these wetlands. There is no basis for permit approval to destroy these wetlands in the current application.

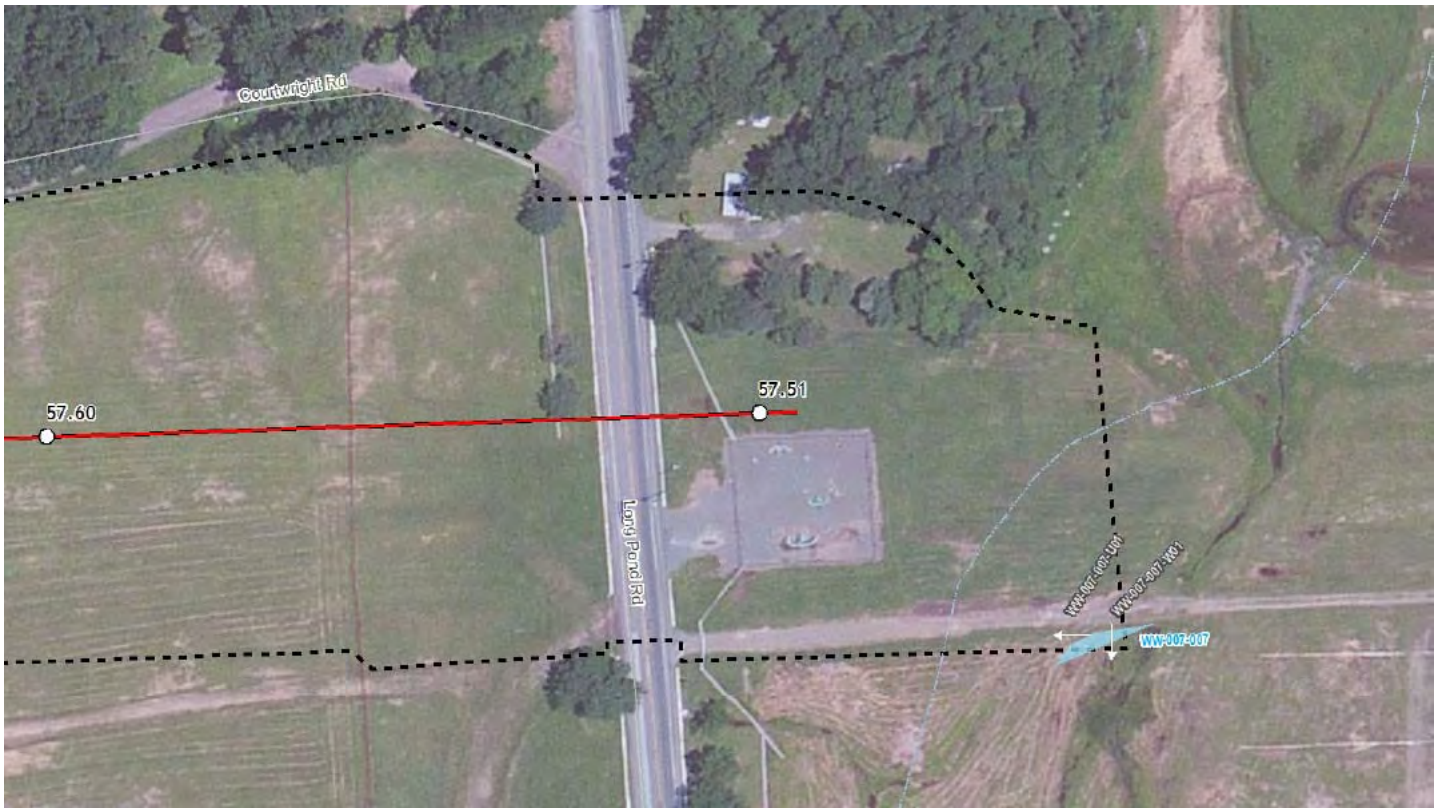


**FIGURE 16.** Compressor Station 515 at northwest end of proposed Franklin Loop. WW-006-004 and WW-013-001 are shown in the corners of the existing cleared area.



**FIGURE 17.** WW-007-006 in Mount Effort pipe storage yard beyond southeast end of Franklin Loop.





**FIGURE 18.** Wetland 007-007 near Long Point Road, adjacent to an unrecognized stream at the beginning of the Franklin Loop construction corridor. This stream has no designated 150-foot wide riparian buffer and was not assigned a segment number.

## Category 2. No Direct Damage Expected

Five wetlands appear unlikely to experience direct damage from Franklin Loop construction and will retain some buffering against indirect impacts. These wetlands will experience indirect impacts from nearby construction and long-term impacts from ongoing pipeline maintenance. Biological habitat functions in these wetlands have been reduced by past Leidy pipeline construction and operation and will be further reduced permanently by the ongoing industrial activity nearby.

**WW-001-017** is a small, herbaceous wetland within the cleared ROW of the existing Leidy pipelines, and it is connected with HQ-CWF, MF Tunkhannock Creek. Its proposed minimum buffer is 50 feet wide.

**WW-001-033** is a small, mostly herbaceous wetland with localized drainage in an area subject to substantial human disturbance and activity connected with an unnamed tributary of HQ-CWF, MF Stony Run. A 50-foot wide buffer from Franklin Loop construction will be maintained adjacent to it. For isolated 0.05-acre **WW-006-001** the mostly forested buffer will be 250 feet wide. This buffer will be maintained intact.

**WW-001-042** is a 0.31-acre, forested wetland currently buffered from the maintained ROW by 30 feet of upland forest. It is connected with an unnamed EV tributary of EV Kendall Creek. Its existing forest buffer will be undisturbed, with no new construction within 75 feet.



**WW-001-048** is a very small, herbaceous wetland connected with an unnamed tributary of HQ-CWF, MF Stony Run within a maintained golf course. No pipeline disturbance is proposed within 120 feet of this wetland.

These five wetlands total 0.47 acre. Their general habitat values and recreational value to humans will be reduced during Franklin Loop construction by the general disturbance and human activities nearby. Other likely functional values will be unaffected, if construction ROW conditions are restored post-construction in accordance with FERC guidelines.

### Category 3. Setback Damage Expected

Eight numbered wetlands are proposed to have no direct surface disturbance to their total of 1.67 acres, but Franklin Loop construction will occur closer than 50 feet to their Applicant-delineated boundaries. In consequence, several of their current functions will be reduced during pipeline construction---particularly natural biological habitat and recreational values. No information is provided by the Applicant that would allow appraisal of baseline conditions or potential changes in their current functions such as natural drainage, groundwater discharge and recharge, or pollution prevention. The post-construction values of these eight wetlands may be reduced also for decades, depending on the time required for, and eventual success of, any restoration within the buffers performed successfully in accordance with FERC guidelines. Where trees will be replanted in the any currently forested buffers following Franklin Loop construction is not shown by the Applicant.

**WW-001-015** is a small, somewhat isolated, herbaceous and scrub wetland within the existing Leidy pipelines ROW, but is only 50 feet from the large and high value WW-001-014. It is to have 20 feet of separation from new construction. **WW-001-018** is a small, forested wetland connected with an unnamed tributary of HQ-CWF, MF Tunkhannock Creek that will have 20 feet of forest buffer separation from new construction instead of its current 85 feet of forest buffer from the existing cleared ROW.

**WW-001-023** is a manmade detention basin that extends beyond the Franklin Loop study area and drains to an unnamed tributary of HQ-CWF, MF Tobyhanna Creek (Figure 19). It currently has no



**FIGURE 19.** WW-001-023 is a manmade stormwater detention basin.

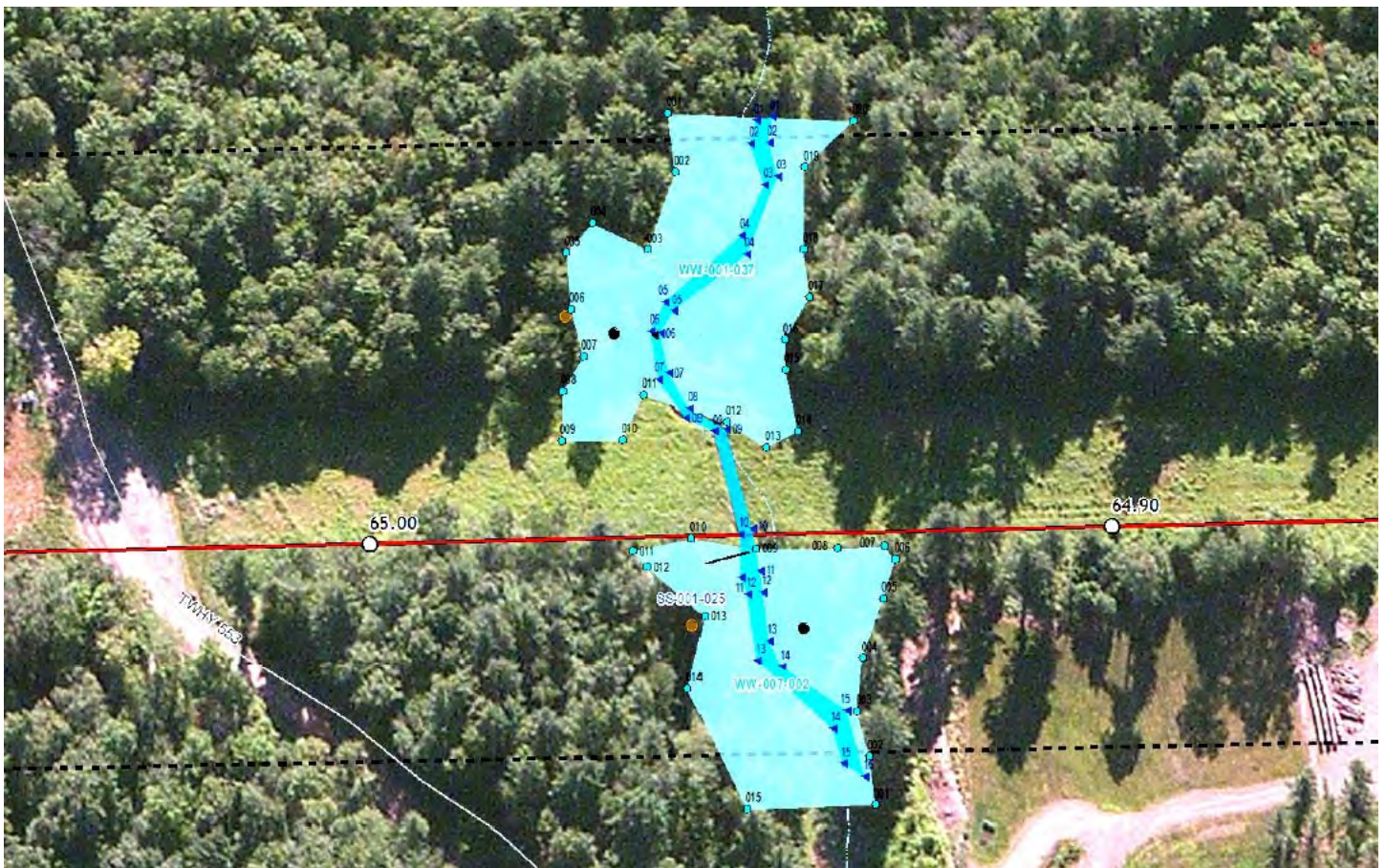


separation from maintained parts of the existing pipelines ROW. Construction is proposed within 30 feet of this wetland. Its current stormwater storage functions probably will not be affected.

**WW-001-029** is an isolated, emergent herbaceous wetland within the existing pipelines ROW. New construction will encroach within 5 feet of its limits.

**WW-001-034** is the lowermost section of an unvegetated artificial impoundment on HQ-CWF, MF Stony Run close to the spillway. It is separated from construction work areas by a minimum of 20 feet consisting largely of existing driveways. The open water of the pond extends for several hundred feet north of the existing Leidy pipelines ROW and is bounded offsite to the north by an extensive scrub wetland complex.

**WW-001-037** and WW-001-044 are mostly forested riparian wetlands extending offsite north of the Leidy pipelines ROW and beyond the Franklin Loop study area (Figure 20). Proposed new pipeline work areas will extend up to the limits of the herbaceous margin of WW-001-037 along the already cleared ROW. This wetland was found by the Applicant's consultant to exhibit suitable habitat for bog turtles during 2013, and it directly abuts an EV unnamed tributary of the Lehigh River. Whether WW-007-002 will be surveyed for turtle populations using the Phase 2 protocol of the US Fish and Wildlife Service when Phase 2 surveys are performed during 2014 is not known.



**FIGURE 20.** Bog turtle habitat exists in WW-001-037 (upper wetland), but WW-007-002 (lower wetland) was not examined in 2013.

At apparently isolated **WW-001-044**, proposed new construction will reduce the forested buffer (currently 30 to 140 feet wide from the maintained ROW) to at minimum 20 feet. Where trees will be replanted in the currently forested buffers following construction is not shown on drawings.

**WW-001-049** consists of two small parcels in a maintained golf course. The larger parcel is an artificial pond. These directly abut an unnamed tributary of HQ-CWF, MF Stony Run. New construction will extend up to the delineated wetland margins.

The 36 wetlands where direct impact is proposed (23 in Monroe County, 13 in Luzerne County) all will have construction within their surrounding margins as a result of Franklin Loop construction. The Applicant does not plan to maintain a 50-foot wide setback from these wetland boundaries as specified by FERC. For these 36 wetlands the following paragraphs focus on direct impacts, exacerbated in each case by construction within the adjacent lands outside the delineated wetland boundaries. The Applicant's plans for restoration of forested areas adjacent to directly impacted wetlands are not clearly described.

#### **Category 4. Direct Damage of Minor Concern**

Eight wetlands totaling 1.80 acres of damage where probably unavoidable direct construction is proposed for the Franklin Loop appear likely to experience relatively minor damage to their existing functions. That disturbance represents 59% of the combined total area of these eight numbered wetlands within the Applicant's 300-foot wide study corridor. The eight minor-concern wetlands share the characteristics of small size and longtime ongoing maintenance that has resulted in primarily herbaceous vegetation along the existing pipelines. These include 0.47-acre **WW-001-022** with surface connection to Tobyhanna Creek (where forested segments have been avoided); 0.35-acre **WW-001-024**, which directly abuts an unnamed tributary to Tobyhanna Creek; 0.31-acre **WW-001-035**, which directly abuts Stony Run; and isolated wetlands **WW-006-003** (0.02 acre) and **WW-001-045** (0.24 acre).

**WW-001-025** is a 1.05-acre actively farmed, isolated wetland in the community of Blakeslee, partly within the Leidy ROW and partly on private land. The natural habitat functions of this wetland at present are minimal. Similarly, nearby **WW-001-026** is a small, isolated emergent herbaceous wetland in the existing ROW. The adjacent residences reduce the natural habitat functions of which this wetland is capable.

Much farther northwest, **WW-001-050** is an apparently isolated 0.45-acre emergent herbaceous wetland in the existing Leidy pipelines corridor. The Applicant's information suggests that it is 90 feet from a private water supply well, which could place it in the Exceptional Value class. The Applicant has submitted no water quantity or quality testing data for wells along the ROW.

Several of the presumably relatively minor current functions of these wetlands will be reduced during pipeline construction---particularly any natural biological habitat and recreational values that they presently exhibit. No information is provided by the Applicant that would allow appraisal of baseline conditions or potential changes in their current functions such as natural drainage, groundwater discharge and recharge, or pollution prevention. The existing level of functions is likely to be recoverable in these eight wetlands, provided topography, drainage, soils, and native vegetation are replaced as per FERC guidelines. Restoration of their herbaceous wetland vegetation should be relatively rapid (less than 5 years), especially if native plants are installed similar to those lost. The Applicant's plans for restoration of forested areas adjacent to directly impacted wetlands are not clearly described.

## Category 5. Intermediate Damage Expected

The eight wetlands where proposed direct damage is expected to be of intermediate significance share several characteristics. They tend to involve proposed wetland forest destruction in relatively small segments of larger wetland corridors that extend outside the Applicant's inventoried Franklin Loop study area. Some are along streams. The natural biological habitat and recreational values of their combined 1.15 acres will be eliminated directly during Franklin Loop construction (40% of their total delineated extent within the study area) and for many decades thereafter unless and until forest cover is reestablished. The functional values of the 1.26 remaining wetland acres in these parcels outside the limits of direct Franklin Loop construction activities will be reduced by the adjacent encroachment into wetlands and FERC buffers. The Applicant has not shown where it may replant native wetland trees or shrubs. No information is provided by the Applicant that would allow appraisal of baseline conditions or potential changes in the current functions of these wetlands such as natural drainage, groundwater discharge and recharge, or pollution prevention.

**WW-001-012** consists of two small parcels (0.09 acre) of riparian wetlands with trees along the banks of Tunkhannock Creek. Trees here apparently are not proposed for destruction, but they are provided no buffers. The forested riparian corridor along the Creek was unbroken prior to construction of the Leidy pipelines.

**WW-001-013** is currently completely forested and extends northeast off the Franklin Loop study area. It is buffered from the existing ROW by 25 feet of upland forest. **WW-001-027** (1.21 acres) is mostly forested and has surface connection with Tobyhanna Creek. It was segmented by past Leidy pipeline construction. Isolated **WW-001-030** (0.34 acre) also is forested. There could be no more than 30 feet of ultimate buffer for the remaining forests of these wetlands after construction, if wetland and/or upland trees were planted outside the 20-foot wide clear corridor along each side of the Franklin Loop D pipeline. Reestablishment of a forest canopy will take decades at minimum, and this Applicant has no drawing that shows replanting of disturbed wetlands or buffers outside its proposed 40-foot wide clear corridor.

**WW-001-032** (0.55 acre) has surface connection with HQ-CWF, MF Two Mile Creek. It is part of a forested wetland extending a few feet offsite into a red spruce palustrine swamp forest, which is a scarce and highly valued ecosystem confined to the Pocono Plateau in Pennsylvania. This ecosystem type is classified as a Special Concern resource by the Pennsylvania Department of Conservation and Natural Resources. This forested wetland was disrupted by prior Leidy pipeline construction. Some wetland forest will be lost here, and the upland forest buffer of the remaining wetland will be reduced substantially. Only 20 feet of buffer upland forest could be established here post-construction outside the 20-foot wide Franklin Loop clear corridor and would require decades to form a forest cover. The Applicant has shown no plan for replanting trees or shrubs here.

**WW-007-009** is a topographically isolated, 0.32-acre to the northwest of the cleared ROW. It contains a natural pond and many downed trees.

**WW-001-047** (0.35 acre) is another forested riparian wetland extending across and beyond the maintained Leidy ROW abutting both sides of a High Quality perennial unnamed tributary of Stony Run (HQ-CWF, MF). Prior construction has disrupted some of the forest cover here along the existing pipelines. No more than 20 feet of wetland forest could be reestablished here outside the Franklin Loop clear zone, if trees were to be planted post-construction.

Isolated **WW-001-046** (0.11 acre) is currently all forested and buffered by 30 feet of upland forest from the Leidy pipeline ROW. It would be possible to replant 30 feet of wetland forest post-construction, but forest in the adjacent buffer would be precluded by the Franklin Loop clear zone.

## **Category 6. High Concern Wetland Impacts**

Direct impacts proposed to at least sixteen and possibly seventeen directly disrupted wetlands along the proposed Franklin Loop warrant identification as 13.92 acres of wetland damages of high concern. As reported by the Applicant, most of these wetlands exhibit one or more of the criteria identifying wetlands as Exceptional Value in Pennsylvania (25 Pa. Code 105.17)---criteria which few of the previously discussed wetlands satisfy. The high-concern wetlands tend to be the largest delineated wetlands in the Franklin Loop study corridor, and together they occupy 51.84 acres of the study area. Many of them are part of much larger wetland complexes that extend far outside the pipeline study area, as shown by National Wetland Inventory maps and Monroe and Luzerne County soil survey maps. Many of these wetlands have been found by the Applicant's consultant to provide habitat suitable for the Pennsylvania Endangered and Federal Threatened bog turtle (*Glyptemys muhlenbergii*).

Past disturbance of the Leidy Southeast pipelines ROW may have reduced some of the functional values of wetland segments that were cleared for pipeline construction, but the adjacent forested wetlands and even some of the wetlands within the ROW should be at or near the optimal for biological functioning as wetland habitat. No information is provided by the Applicant that would allow a detailed appraisal of baseline conditions or potential changes in their current functions such as natural drainage, groundwater discharge and recharge, or pollution prevention. The high-concern wetlands are discussed in sequence from southeast to northwest along the proposed Franklin Loop, which follows the course of earlier Leidy pipelines and is to encroach outward from the existing ROW.

From developed lands near the Pocono Raceway the Leidy Southeast pipelines extend across 30-foot wide Tunkhannock Creek and through almost unbroken forest in Tunkhannock Township for 3 miles to Tobyhanna Creek and the community of Blakeslee (Figure 21). Interstate 80 crosses this section of the pipeline corridor. The Nature Conservancy and Tunkhannock Township Fern Ridge Bog Preserve lands comprise 7.86 acres along 0.6 mile within the Franklin Loop ROW. But for the prior disturbance by the Leidy pipelines, the four numbered wetlands (5 delineated parcels: WW-001-014, WW-001-016, WW-001-019, and WW-001-020) within the Preserve section of ROW would be expected to exhibit the maximal functions of high-elevation, unfragmented forest wetlands. (WW-001-015 and 001-018, also within the Fern Ridge Bog Preserve, were discussed above in the section on Setback Damage Concerns.)

Between this Nature Conservancy Preserve and Interstate 80, **WW-001-014** (2.35 acres) and **WW-001-016** (1.11 acres) are mostly forested wetlands extending beyond the Franklin Loop study corridor in both directions. The former abuts an unnamed tributary of Tunkhannock Creek directly, and the latter probably has surface connection to a Tunkhannock tributary offsite. The Leidy pipelines ROW here was disturbed for prior pipeline construction for a width of about 125 feet. The wetland vegetation within the ROW of WW-001-014 has begun to recover as palustrine scrub (PSS). It is part of a corridor of at least 20 acres of forested wetland extending mainly to the east of the pipeline corridor within the 1,200-acre Fern Ridge Bog Preserve at Adams Swamp property of The Nature Conservancy. This relatively undisturbed example of boreal conifer and acidic shrub swamp occupies a glacial kettle lake which gradually filled after the ice sheet melted but still supports plants





FIGURE 21. Southern section of Franklin Loop corridor. Pocono Raceway at extreme right.

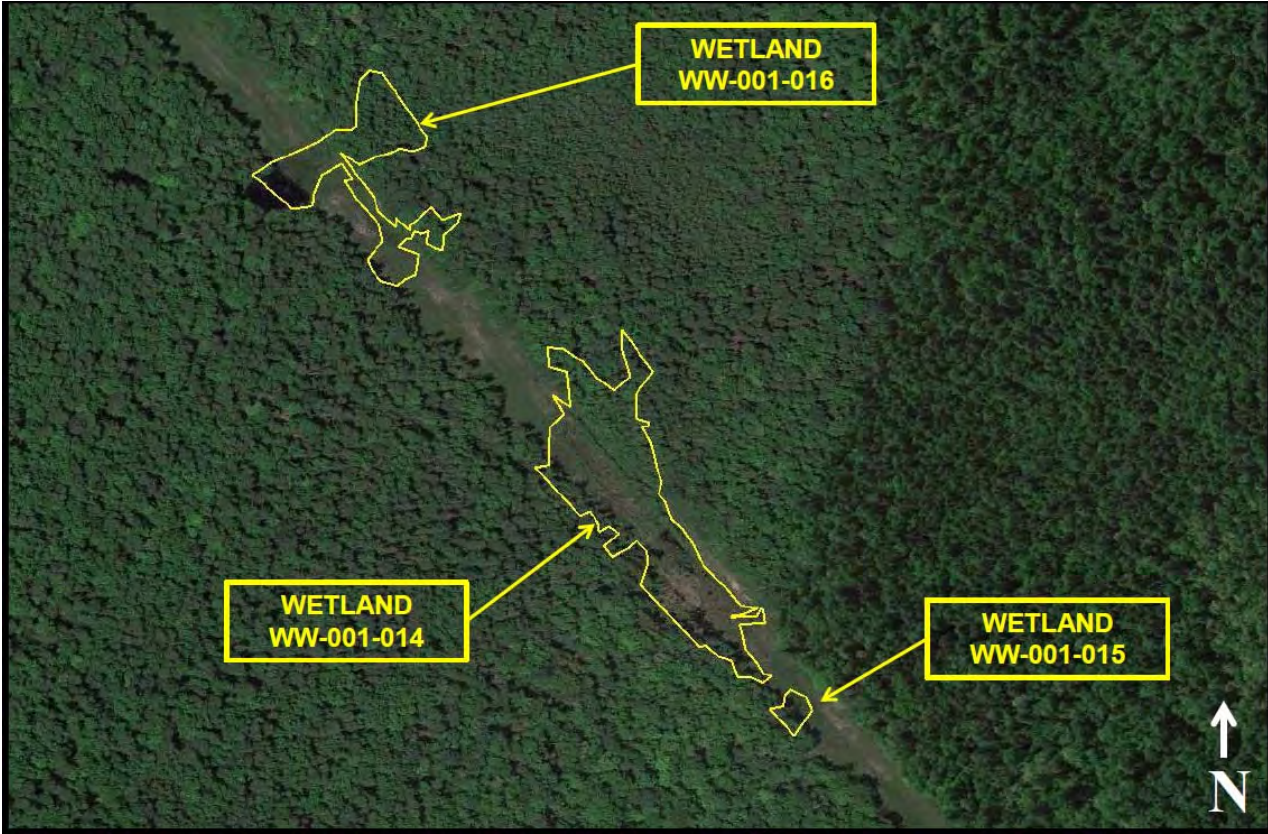


FIGURE 22. Aerial view of WW-001-014, -015, and -016.





**FIGURE 23.** PSS/PEM (left) and PFO (right) in wetland WW-001-014.

typical of more northern habitats. The Applicant's consultants found habitat suitable for bog turtles in the onsite section of this wetland and classified WW-001-014 as having Exceptional Value (Figures 22 and 23). The corridor of which WW-001-016 is a part extends across the pipeline study corridor and continues to the north as another major forested wetland within the Fern Ridge Bog Preserve. There are unrecognized ponds along the southwestern margin of the study area in WW-001-016 and 001-017 (Figures 22 and 24).

**WW-001-019** is a 0.4-acre emergent wetland abutting an unnamed tributary of Tunkhannock Creek within the cleared Leidy Southeast pipelines ROW. It drains to the north through SS-001-049, and there is an unrecognized pond along the southwestern margin of the study area in WW-001-019.



**FIGURE 24.** Unbuffered pond at WW-001-016 in the Fern Ridge Preserve, as photographed by Applicant's bog turtle consultant.



**WW-001-020** (3.71 acres) is part of a much larger scrub and emergent wetland that forms a major forested wetland corridor abutting an unnamed tributary of Tunkhannock Creek. Both these wetlands also are within The Nature Conservancy's Fern Ridge Bog Preserve and were reported by the Applicant's consultant to provide habitat suitable for bog turtles in 2013. The Applicant classified WW-001-020 as Exceptional Value (Figure 25).

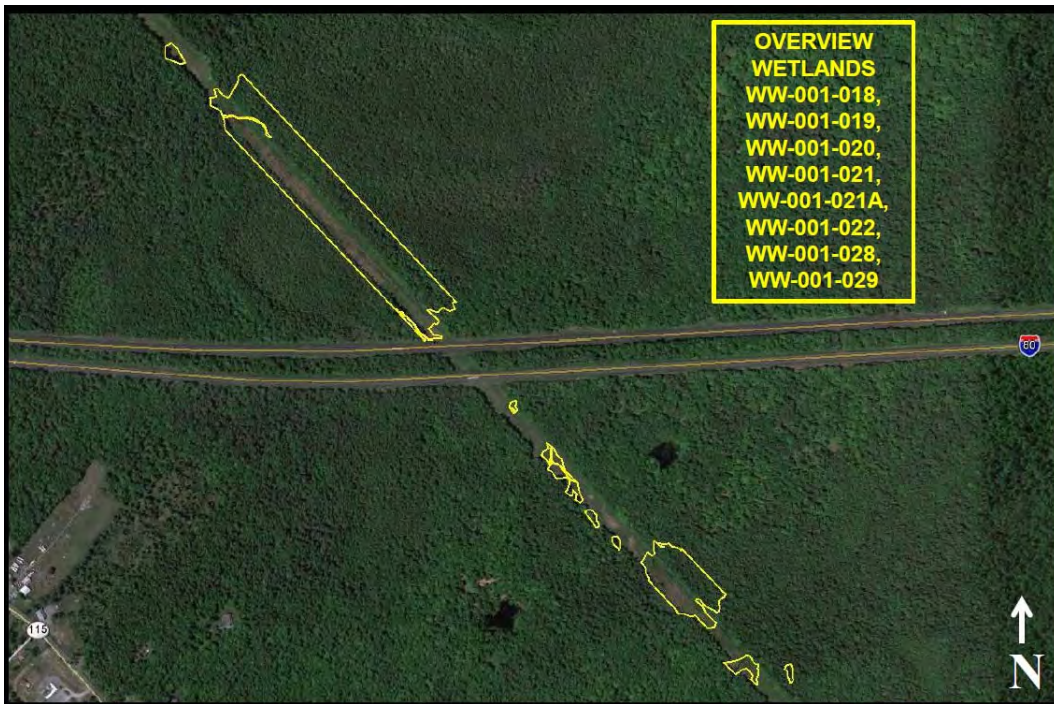
**WW-001-021** consists of three parcels (0.81 acre) within the Leidy pipelines ROW northwest of the Fern Ridge Bog Preserve and southeast of Interstate 80. This is a forested landscape unbroken but for the ROW. This wetland complex supports emergent herbaceous vegetation and abuts an unnamed tributary of Tunkhannock Creek. It was described by the Applicant's consultant as providing suitable bog turtle habitat in 2013.

**WW-001-028** (14.45 acres) is to undergo the largest single expanse of direct wetland damage (4.27 acres) along the proposed Franklin Loop. This wetland abuts an unnamed tributary of Tobyhanna Creek. It begins just north of Interstate 80 and extends for about 2,000 feet along the ROW (Figure 26). A mixture of scrub and emergent herbaceous vegetation has occupied virtually the entire cleared ROW of the Leidy pipelines. The forested wetland corridor crossed by the ROW extends



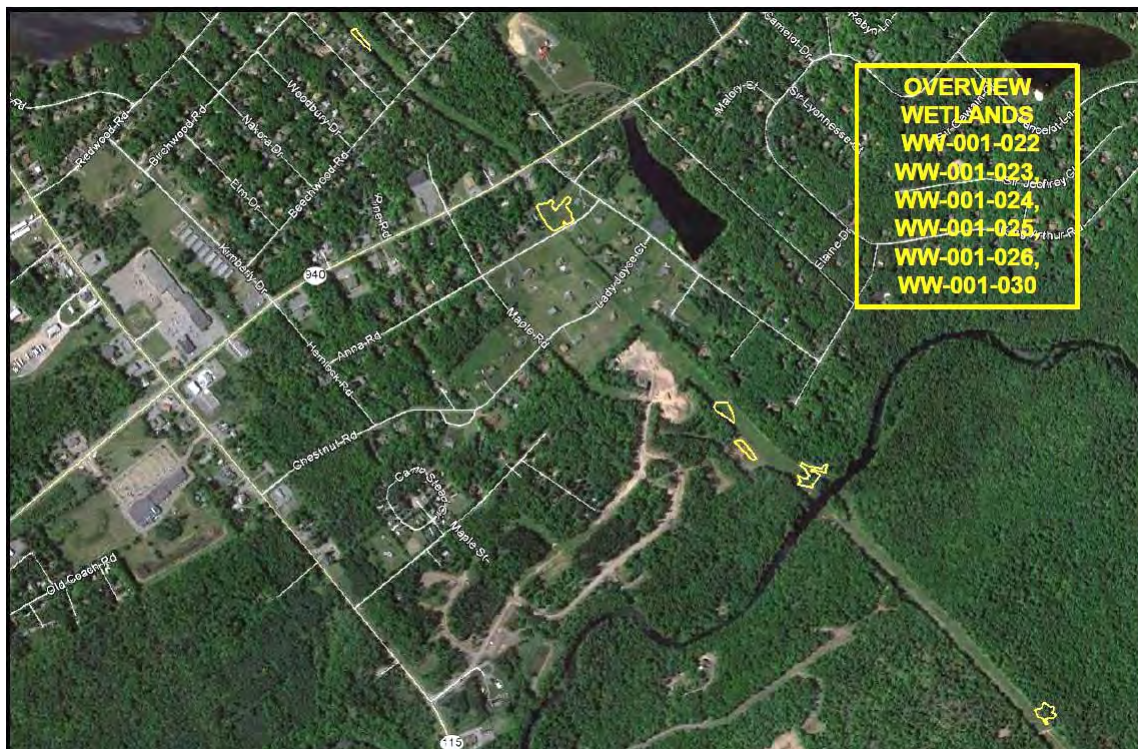
**FIGURE 25.** Applicant's Exceptional Value Wetland WW-001-020 in the Fern Ridge Preserve, as photographed by the Applicant's wetland consultant.





**FIGURE 26.** Wetlands along the Franklin Loop corridor near Interstate 80.

offsite in both directions and occupies more than 70 acres. The pipeline study area wetlands here were described by the Applicant's consultant as habitat suitable for bog turtle in 2013. The Applicant classified WW-001-028 as Exceptional Value. The unbroken forest (save for the pipeline ROW) continues northeast beyond WW-001-028 about 0.8 mile to 70-foot wide Tobyhanna Creek.



**FIGURE 27.** Wetlands along Franklin Loop corridor in Blakeslee, Tobyhanna Township, Monroe County, Pennsylvania.





**FIGURE 28.** View northwest into WW-001-036. The corridor has been reoccupied by closed canopy wetland forest beyond the investigators (May 2014). Forest apparently can be tolerated on the ROW.

Northwest of Tobyhanna Creek the pipeline ROW passes through the community of Blakeslee, where there are numerous residences within 200 feet of the existing and proposed pipelines in Tobyhanna Township (Figure 27). The ROW then passes through the edge of another mostly forested wetland complex that extends offsite to the north and east. Here the Applicant's consultants delineated four parcels of **WW-001-031** (3.13 acres), through which passes Two Mile Run (SS-001-021), an HQ-CWF, MF stream. This delineated wetland supports emergent herbaceous vegetation and is within a game propagation and protection area registered by the Pennsylvania Game Commission. Small areas of existing wetland were omitted from the Applicant's drawings just south of wetland boundary delineation flags 0039 and 0040 as well as flags 065 and 066.

**WW-001-036** is the largest existing wetland (17.27 acres) in the Applicant's Franklin Loop study corridor. The 2,000-foot long wetland section of 100-foot wide ROW of Leidy pipelines is largely continuous forest, with only small areas of scrub (Figure 28). It is surrounded on both sides by primarily wetland forest beyond the study corridor limits forming a forested wetland area of at least 30 acres. It may be connected with surface watercourses outside the Franklin Loop study corridor. The Applicant's consultant found habitat suitable for bog turtles here during 2013, and the Applicant listed this wetland as Exceptional Value.

**WW-007-002** (0.45 acre) and **WW-001-037** (0.66 acre) occupy the forested banks of an unnamed EV tributary to the Lehigh River. This forested riparian wetland corridor was severed by the Leidy pipelines to form these two numbered wetlands. Some emergent herbaceous vegetation has become reestablished, and there is some non-wetland in the associated section of ROW. As riparian wetlands within the default 100-foot wide floodplain along an EV Pennsylvania stream not mapped by the Federal Emergency Management Agency (FEMA), these are EV wetlands. The Applicant's herpetological consultant found habitat suitable for bog turtles in WW-001-037 during 2013, but apparently did not examine WW-007-002 just downstream to the west (Figures 20 and 29). The February 2014 drawings show direct impact proposed in WW-007-002, but not in 001-037. (The latter wetland would be affected by loss of buffer, as discussed above.)



**WW-001-038** (0.65 acre) is an elongate wetland that parallels the Lehigh River within its FEMA-mapped floodplain (Figures 29 and 30). It is forested, except where emergent herbaceous vegetation has become reestablished after pipeline construction. Situated within the floodplain of an EV watercourse (the Lehigh River), this is an Exceptional Value wetland. Its functional values can be presumed to be high. The adjacent Lehigh River is a 55-foot wide, EV stream that hosts wild trout populations. It forms the boundary between Monroe and Luzerne Counties.

Across the Lehigh River in Buck Township, Luzerne County, the Leidy pipelines ROW extends westward from the bank of the Lehigh River for about 3 miles through almost unbroken forest. **WW-001-039** (0.94 acre) is forested, except where emergent herbaceous vegetation has established after pipeline construction. The eastern section of this wetland, within the floodplain of an EV stream (the Lehigh River), is an EV wetland (Figure 30). Its functional values can be presumed to be high.



**FIGURE 29.** WW-01-036 is at lower right; Lehigh River and WW-001-038 are at upper left. WW-001-037 is in center, just south of Township Route 553. The adjacent WW-007-002 is not shown on this graphic from the Applicant's 2013 bog turtle survey report.

**WW-001-040** is another riparian wetland delineated by the Applicant as 2.56 acres along both sides of an unnamed EV tributary of the Lehigh River (Figure 31). It continues offsite to the south of the Franklin Loop study corridor. This wetland is forested except where prior pipeline construction has resulted in emergent herbaceous and scrub vegetation. Its functional values can be presumed to be high.

**WW-001-041** is a 1.05-acre forested wetland abutting an EV tributary of EV Kendall Creek. It is forested, except for the 100-foot wide corridor that supports emergent herbaceous vegetation as a result of past pipeline construction. Its functional values can be presumed to be high, and it qualifies as an EV wetland.





**FIGURE 30.** View northwest across WW-001-038, the Lehigh River, and WW-001-039. Bluff in foreground drops steeply; Franklin Loop D pipeline stakes at left. The hillside rises steeply in Luzerne County (background) beyond wetlands in the Lehigh River floodplain (May 2014).

**WW-009-002** is another completely forested EV wetland of 1.99 acres, which extends for several hundred feet offsite to the south from the Franklin Loop study corridor. This wetland extends along both sides of upper Kendall Creek, an EV stream that flows to the Lehigh River. It is separated from 1.39-acre **WW-001-043** only by the 20-foot wide road through the center of the Leidy pipelines ROW (Figure 32). WW-001-043 also is forested except for land maintained as emergent herbaceous vegetation in the existing pipelines corridor. The functional values of these wetlands can be presumed to be high.

**WW-009-001** is 1 acre delineated at the northern end of a major wetland extending hundreds of feet to the south of the Franklin Loop study corridor. It is crossed by several tributaries of Stony Run, an HQ-CWF, MF stream (Figure 33). Its vegetation is primarily scrub, and it was classified as an Exceptional Value wetland by the Applicant. Its functional values can be presumed to be high.

The Applicant did not provide any assessment of the Franklin Loop construction as a cumulative whole on wetland resources in the extraordinarily sensitive ecosystems that surround this ROW. Impacts on wetlands have been identified resulting from construction activities many hundreds of feet away (Houlahan *et al.* 2006). Impacts on streams were not detailed, although many feet of





**FIGURE 31.** Wetland WW-001-040 along EV tributary (SS-001-027) to the Lehigh River.



**FIGURE 32.** Wetlands WW-001-043 (above) and WW-009-002 (below) with EV tributary SS-001-029 to Kendall Creek.





**FIGURE 33.** Wetland WW-009-001 extends offsite to the southwest of the Franklin Loop study area.



**FIGURE 34.** Part of a 1,700-foot long watercourse labeled SS-001-016 by the Applicant's wetland consultant. This channelized feature is not discussed in the application, but is labeled an unnamed tributary to Tobyhanna Creek and assigned a riparian buffer on the soil erosion drawings. View across existing Leidy pipeline ROW is toward embankment of WW-001-023.

streamcourse likely will be permanently impacted like SS-001-016 was by earlier Leidy pipelines along the Franklin Loop (Figure 34). The Applicant also did not address any additional impacts that would be induced by the Franklin Loop, which is intended to receive gas from new shale gas wells by way of new gathering pipelines.

## PROPOSED MITIGATION

The Applicant has proposed offsite mitigation for its intended damage to wetlands during construction of the Franklin Loop. The mitigation also could be proffered to serve as partial compensation for proposed construction with earth disturbance within the 150-foot wide riparian corridor at 33 (actually at least 35) Special Protection streams, but apparently is not. It is not possible to ascertain whether the Applicant plans to maximize restoration of wetland functions along the Franklin Loop ROW post-construction. Wetland areas outside the clear zone are to be “allowed” to revegetate naturally. Some buffer areas apparently are to be replanted with forest trees, but parts of the riparian buffer areas are proposed to be kept free of trees and shrubs permanently. No post-construction stormwater management plan shows where these measures will be employed. The application states that the Applicant plans to remove and restore its proposed access roads following Franklin Loop construction.

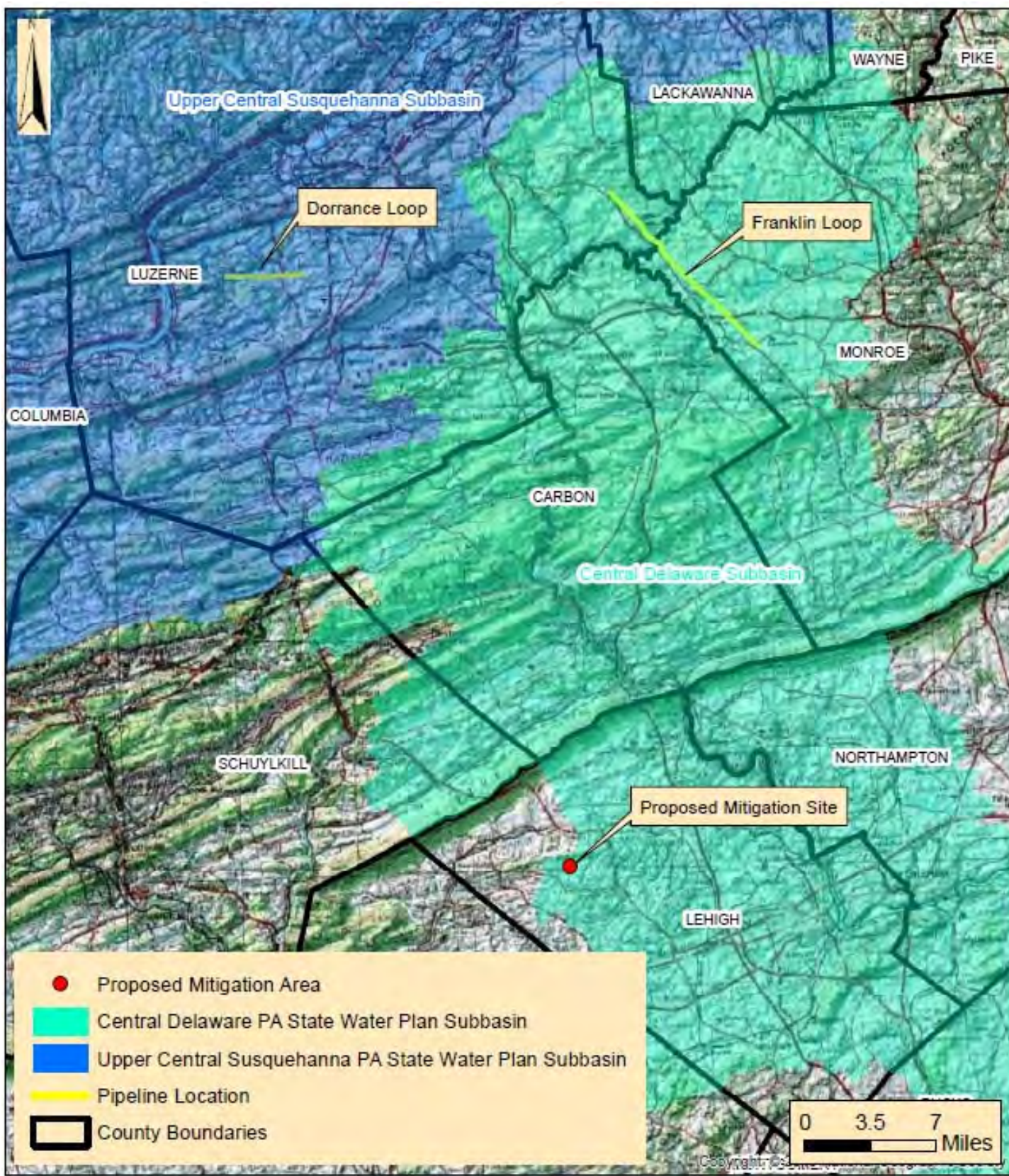
The planned disturbance to 33 Special Protection streams will destroy 4,138 linear feet of streambed (1.20 acres per mitigation plan narrative; 1.1 acres per Applicant’s Table A-1 of its Appendix A1) plus virtually all the existing vegetation along 8,276 linear feet of Special Protection (EV and HQ) stream banks. This would represent 9.5 acres of 50-foot wide FERC buffer along the banks of Special Protection streams. The streambeds are to be returned to some semblance of their original physical condition per FERC drawing details. No compensatory mitigation is proposed for these construction activities in waters of the United States. No preconstruction stream inventory was made, and there is no proposed monitoring to demonstrate the successful restoration of the streambeds post construction.

The Applicant states that five of its affected wetlands and nine affected streams are designated Exceptional Value, the highest use category in Pennsylvania and the equivalent of Tier 3 Outstanding National Resource Waters in the language of the federal Clean Water Act. As indicated in Table B, 15 of the directly affected wetlands meet one or more PADEP EV criteria. Nine of these EV wetlands will experience permanent loss of existing forest and/or scrub vegetation. At least 5 “other” wetlands will have permanent conversion of woody vegetation.

The Applicant’s mitigation plan appears to have been prepared independently of any analysis of the damages to wetland functions along the Franklin Loop. It appears to be premised on acres of wetlands disturbed permanently or “temporarily” and acres of offsite wetlands to be “enhanced”.

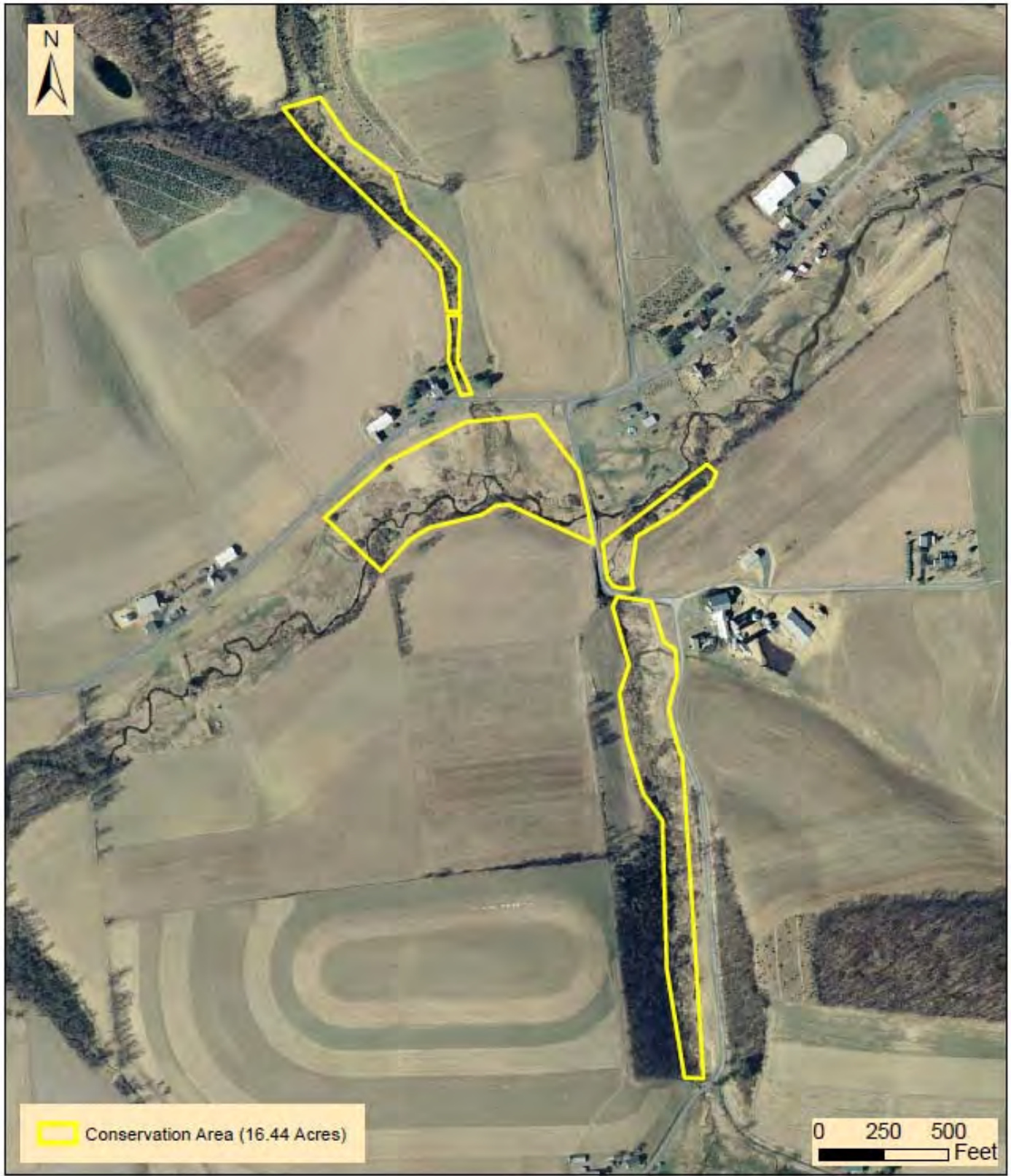
The proposed mitigation site is 30 miles from the Franklin Loop on the Bleiler Farm in a rural section of Lehigh County (Figure 35). The plan proposes to dedicate a 16.44-acre, mostly riparian zone permanently to conservation uses (Figure 36). The width of the conservation area varies from about 30 to 340 feet along 1,500 linear feet of Switzer Creek plus 3,000 linear feet of two unnamed tributaries, all designated HQ-CWF, MF streams. Within the conservation easement the Applicant proposes to plant 56 trees and 104 shrubs in clumps along approximately 2,000 linear feet of streambank along the watercourses where there currently are wetlands (Figure 37). The plantings are intended to enhance 7.99 acres of existing “degraded floodplain wetlands” already reverting to scrub through natural succession (Figure 38). The mitigation report narrative addresses only wetlands, not stream buffers.





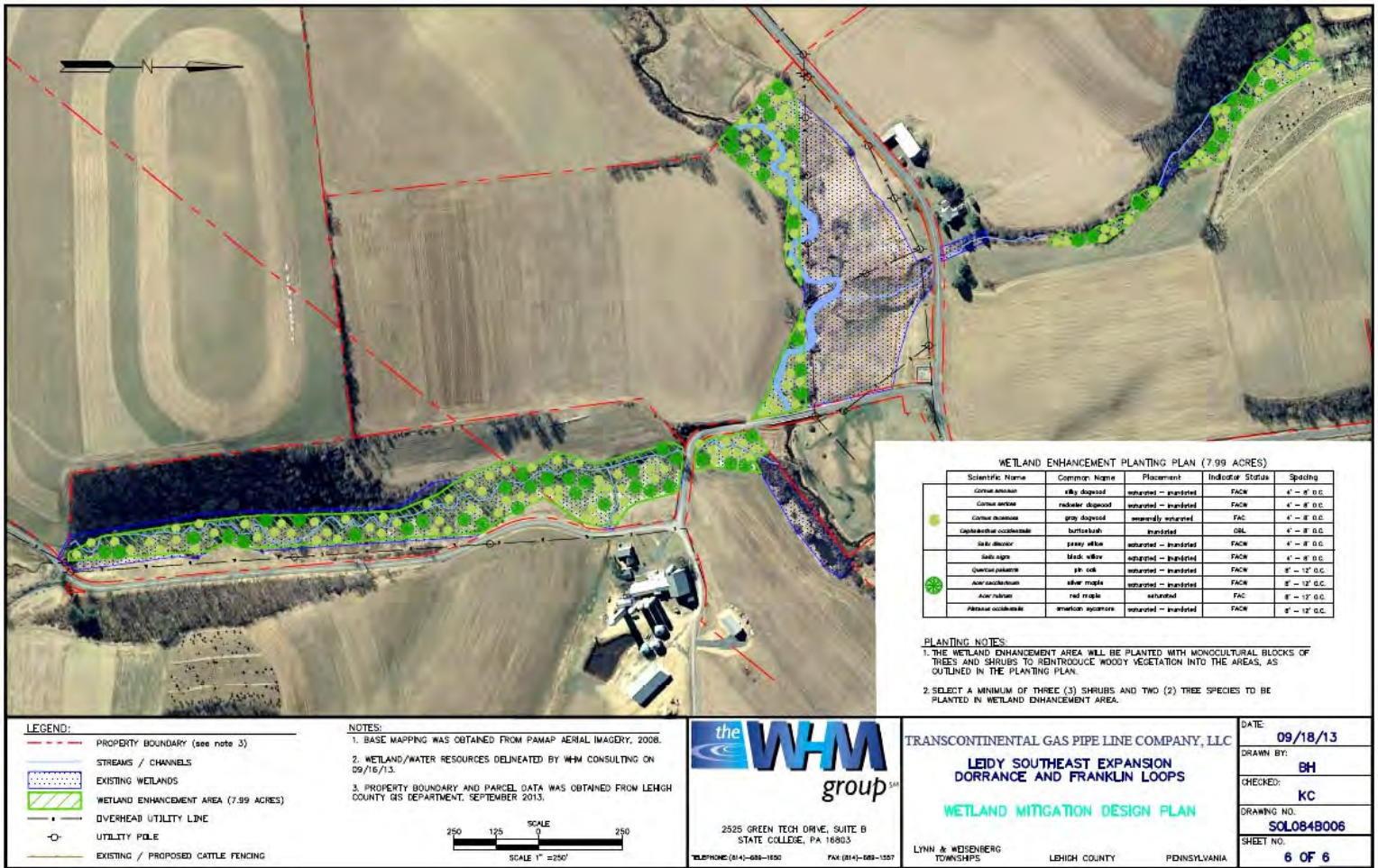
**FIGURE 35.** Location of Applicant’s proposed mitigation site in Lehigh County for damage along the proposed Franklin and Dorrance Loops of the Leidy Southeast pipeline expansion in relation to the pipeline corridors in Monroe and Luzerne Counties.





**FIGURE 36.** Extent of proposed conservation easement for Franklin and Dorrance Loops mitigation during Leidy Southeast pipeline extension, Bleiler Farm, Lynn and Weisenberg Townships, Lehigh County, Pennsylvania. Switzer Creek flows from southwest to northeast across the central section of the photograph.





**FIGURE 37.** Applicant’s proposed wetland mitigation plan, Bleiler Farm, Lehigh County, Pennsylvania. Ross Valley Road is at left; Bausch Road parallels Switzer Creek in the center of the view in the upper section of the drawing. Homestead Road is at the center bottom.

The plan claims to convert sufficient existing offsite herbaceous wetland vegetation at the Bleiler Farm eventually into scrub and forest wetland vegetation to provide 2:1 acreage for scrub wetlands converted permanently to herbaceous and 3:1 acreage for forest converted to herbaceous vegetation along the Franklin Loop. (In addition, about 11.37 acres of “temporary” destruction of pipeline wetlands onsite will continue for an indefinite period until the unassisted but “allowed” natural revegetation of these areas occurs.)

The measurements reported in Table B suggest that the proffered 8 acres of offsite herbaceous wetland accelerated “conversion” at the Bleiler Farm would be 9 acres “short” of achieving the Applicant’s claimed ratios (3 x 4.3 ac = 13 ac for PFO converted + 2 x 2 ac = 4 ac for PSS converted = 17 ac total needed), considering only the Franklin Loop. (The same proposed offsite mitigation is proffered to compensate also for damages along the Dorrance Loop, not discussed here.) The Bleiler Farm conservation easement is to be fenced against entry by livestock. There is no mention of a Jurisdictional Determination having been sought or secured for the mitigation area. All of the existing mitigation area wetlands apparently are “other” wetlands (not Exceptional Value), as defined by PADEP. No wetland expansion is proposed at the Bleiler Farm by either wetland restoration or creation.

If the mandatory 150-foot wide Chapter 102 riparian buffer along Special Protection waters were considered, the direct riparian buffer disruption along the Franklin Loop pipeline would incur at least 28.5 acres of impact. The Applicant does not show where any wetland or upland riparian buffers are to be dedicated or replanted along the streams of the Franklin Loop ROW. The opportunity to plant and dedicate stream buffers onsite---everywhere except within the approximately 50-foot wide clear zone for the D pipeline and whatever clear zones are needed for the older Leidy pipelines---appears not to have been taken.

The Applicant's photos and airphotos show no apparent degradation in the existing wetlands on the Bleiler Farm north of Werleys Corner apart from a few invasive autumn olive (*Elaeagnus umbellata*) shrubs needing removal. According to PADEP (2014) 1.9 miles of Switzer Creek and both its onsite Unnamed Tributaries 26291865 and 26292199 generally attain at least one designated use. A Total Maximum Daily Load limitation was listed in 2011 as necessary for 3.64 miles of Switzer Creek currently degraded by habitat alteration and agricultural siltation affecting aquatic life. No data were provided in the mitigation report on the existing (attained) use of these waterways within the conservation easement. The mitigation report says the wetlands on the Bleiler Farm already are reverting to scrub with dogwoods and willows as a result of natural succession (Figures 38 and 39). The southernmost Bleiler wetland (#4) along the road where 2013 data were collected is said to have a 20% cover of purple loosestrife (*Lythrum salicaria*), a pretty but invasive non-native herbaceous plant, which is to be removed.





**FIGURE 38.** Proposed riparian wetland enhancement area along Switzer Creek on the Bleiler Farm.





**FIGURE 39.** View north along Ross Valley Road in 19 May 2012 photograph from Google Earth. Wetlands in Applicant's Wetland 4 are beginning to attract shrubs and trees along Unnamed Tributary 26292199. The riparian forest at far left is not to be protected by the Applicant's conservation easement, which also does not include the cultivated field between the road and the wetland. A 150-foot wide riparian buffer here would eliminate the field along the roadway.

The Applicant does not identify any specific wetland functions that will be enhanced at the mitigation site or compare them with functions lost along the Franklin Loop. About 4,350 linear feet of Lehigh County streambanks appear to be slated for "improvement" by planting the 56 trees and 104 shrubs in existing wetlands, counting each side of the streams separately. The breakdown is 375' along one side of a Switzer Creek segment in Wetland 1; 1,050' along both sides of a segment of UNT 03529 (Applicant's UNT #1) in Wetlands 2 and 3 north of Switzer Run; and 2,100' of UNT 03530 (Applicant's UNT #1) south of Switzer Run (Figures 37 and 39). No plantings are proposed by the Applicant in

most of Wetland 1 or in Wetland 5 at the Bleiler Farm. At the PADEP-recommended riparian forest planting rate of one tree or shrub per 100 square feet, the Applicant's proposed planting of 160 individual trees and shrubs would revegetate about 0.4 acre of streambank buffer (107 linear feet or 54 feet if along both sides of the stream).

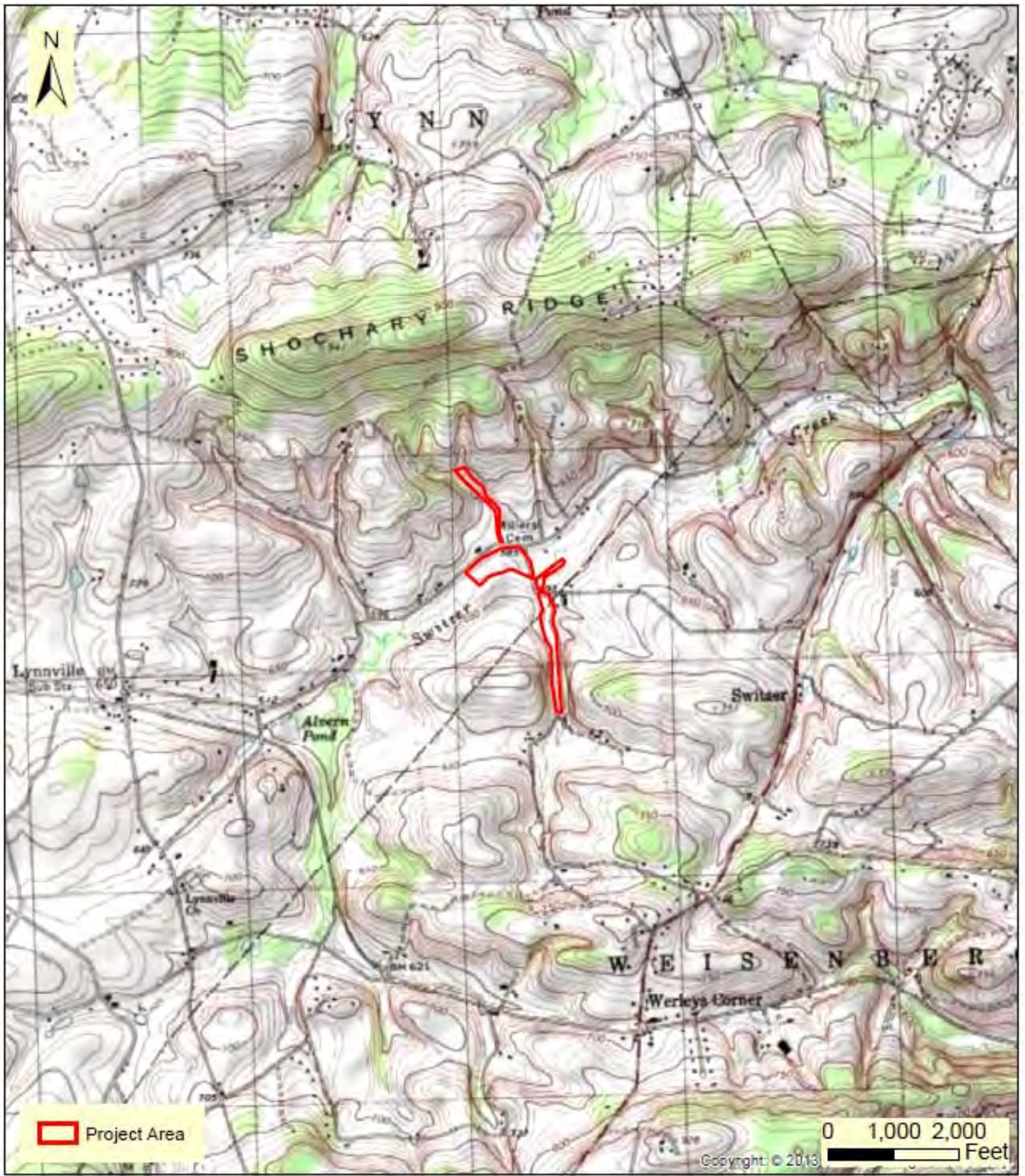
Switzer Creek water flows into Jordan Creek, whose waters join Little Lehigh Creek briefly before entering the lower Lehigh River en route to the Delaware River. The two unnamed tributaries within the conservation easement are small-watershed headwater streams, but (like Switzer Creek itself here) are over the 100-acre drainage area waiver threshold [25 Pa. Code 105.12(a)(2)] and thus theoretically subject to PADEP protection from unauthorized alteration by future obstructions and encroachments into the watercourses. To the extent that a conservation easement would be beneficial in preserving the stream corridors here against further narrowing in the future, downstream water quality may benefit in the lower Lehigh and Delaware Rivers. As currently proposed, the easement would protect very little of the existing, scarce riparian forest on the Bleiler Farm.

If stream protection at the Bleiler Farm locally, as well as in the Lehigh/Delaware River watershed, were a primary objective of proposed mitigation, it would appear preferable to dedicate, fence, and plant new wetland or upland forest buffers outside the existing wetlands on the Bleiler Farm. Such measures could yield a minimum 150-foot wide wooded strip between the active cornfields and any adjacent wetlands and streambanks on both sides of the streams (as mandated by Chapter 102 regulations) and demonstrate a serious effort to mitigate Franklin Loop damages by maximizing offsite water resource protection at the Farm to the benefit of Switzer Creek and its tributaries. Instead, seedling trees and shrubs of unspecified, presumably small size chosen from a list of several native species are to be inserted into the herbaceous wetlands that have been protecting the streams here already for many decades. Some non-native invasives are to be removed.

There is to be no proposed expansion of forested riparian buffers along the cultivated fields at the Bleiler Farm---where row crop farming comes as close as 10 feet to the stream channels (as can be seen in Figures 36 and 37). If the conservation easement were widened to encompass 150 feet minimum along both sides of the identified segments of the Bleiler Farm streams, its area would be more than doubled. The existing riparian forest areas here could be afforded easement and maintenance protection, which the current plan does not, and the missing forest could be planted and maintained along currently barren segments of stream bank. There appears to be considerable opportunity to expand the easement along Switzer Creek, if additional wetland impacts or riparian buffer from the Franklin Loop were to be mitigated here. Substantial additional planting of trees and shrubs would be necessary, at the PADEP (2010) recommended rates of 435 trees per acre on 10-foot centers in 50-foot wide Zone 1 (directly next to the stream) and 435 trees and shrubs per acre on 10-foot centers in 100-foot wide Zone 2, to provide eventual functioning forested riparian buffers for the streams of the Bleiler Farm.

Mitigation here in the Great Valley farmlands of Lehigh County will do nothing for the Pocono Plateau resources of Monroe and Luzerne Counties, which not only are 30 miles away, but are in forested high-elevation headwaters at 900 to 1,400 feet higher elevation than the proposed mitigation site (Figure 40). The Bleiler Farm is at about 575 feet elevation and is 6 miles south of Blue Mountain, in a very different physiographic region than the Franklin Loop. UNT 03529 (Applicant's #1) drains a small watershed, of which more than half supports forest on Shochary Ridge (Figure 40). Neither UNT 03530 (Applicant's #2) nor the Switzer Creek watershed today has as much as 20% forest cover. The damaged high-elevation headwaters include 7 Exceptional Value streams, of which there





**FIGURE 40.** Context of the proposed mitigation area at the Bleiler Farm on US Geological Survey topographic basemap. The conservation easement is outlined in red.



are none at the Bleiler Farm site; all the rest of the streams are designated HQ-CWF, MF in both the impact and mitigation areas.

No mention of any biological resources appeared in the Pennsylvania Natural Diversity Inventory database query results for 24 acres of the Bleiler Farm that were checked by the Applicant's consultant. No claim of existing bog turtle habitat or potential habitat for bog turtles to be created is made for the Bleiler Farm easement. The proposed plant species for installation here are not those unique to the Pocono plateau. It will take close to a century for planted trees to offer habitat for Indiana bats whose forested habitat is being lost along the pipeline.

The Applicant could be putting back wetlands onsite where they previously were destroyed when constructing the poorly sited earlier Leidy pipelines, and then planting shrubs and trees not only where they were removed to install the new Franklin Loop pipe D, but also for land previously damaged for other pipes (outside the minimum areas that must be kept open for pipeline maintenance). Already some scrub and herbaceous revegetation has been allowed within the Leidy pipelines ROW, much of which will be disrupted again during Franklin Loop D line construction (Figure 28).

Given the extraordinary natural resources proposed for damage, it would be wise to restore maximally what was damaged, putting land back into wetlands and reconnecting now-fragmented wetland parcels in the Pocono ecosystem traversed by the Franklin Loop before addressing offsite mitigation. There is no offer to plant any native wetland or upland vegetation along the Franklin Loop, but only to "allow" revegetation by wild plants naturally. So why not also "allow" easement-protected Bleiler Farm wetlands also to continue to revegetate naturally? They already are well on their way toward natural succession to woody vegetation and are protecting the streams a bit in the process. To mitigate water quality damage, the Applicant needs at minimum to plant new riparian forest buffers along both the Franklin Loop pipeline streams and wetlands and along streams at the Bleiler Farm--- permanently dedicated areas of existing or future forest land along the streambanks.

## **ACKNOWLEDGMENTS AND AUTHORSHIP**

The authors express appreciation to several landowners along the Franklin Loop ROW who allowed us to inspect site conditions. Many of the drawings and photographs presented here are excerpted from the Williams Transco Franklin Loop 2013 and 2014 documents submitted to PADEP: Figures 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, and 15 from application drawings; Figures 16, 17, 18, 19, 20, 23, 25, 31, 32, 33, and 34 from a consultant's wetland and stream delineation report; Figures 21, 22, 24, 26, 27, and 29 from a bog turtle consultant Phase 1 report; and Figures 35, 36, 37, 38, and 40 from a consultant's wetland mitigation report. Figure 39 is from Google Earth.

This report was prepared by James A. Schmid, a biogeographer and plant ecologist, with the assistance of Stephen P. Kunz. Dr. Schmid received his BA from Columbia College and his MA and PhD from the University of Chicago. After serving as Instructor and Assistant Professor in the Department of Biological Sciences at Columbia University and Barnard College, he joined the environmental consulting firm of Jack McCormick & Associates of Devon, Pennsylvania. Since 1980 he has headed Schmid & Company of Media, Pennsylvania.

Dr. Schmid has analyzed and secured permits for some of the largest wetland mitigation projects in the mid Atlantic States, as well as a myriad of smaller projects. He is certified as a Senior Ecologist by the Ecological Society of America, as a Professional Wetland Scientist by the Society of Wetland Scientists, and as a Wetland Delineator by the Baltimore District, Army Corps of Engineers. He has

served on the professional certification committees of the Ecological Society and the Society of Wetland Scientists.

When the US Fish & Wildlife Service Pleasantville Office evaluated actual compliance with approval conditions requiring mitigation by about 100 of the Clean Water Act Section 404 fill permits issued by the Corps of Engineers in the State of New Jersey during the period 1985-1992, every Schmid & Company mitigation project was judged in the field to exhibit full compliance with all permit requirements and mitigation goals. Schmid & Company mitigation projects represented 21% of all the mitigation projects judged fully successful in New Jersey by USFWS in its written report to USEPA. Dr. Schmid analyzed and secured Wetland Mitigation Council approval for the first major freshwater mitigation bank in New Jersey on behalf of DuPont. That bank was donated to The Nature Conservancy. Dr. Schmid often lectures and publishes on environmental assessment and mitigation, drawing on examples from his continuing practice when securing permit approvals.

Dr. Schmid has often analyzed environmental regulatory programs and commented on proposed regulations. His clients continue to include the construction industry, conservation groups, and government agencies, including the Pennsylvania Department of Environmental Protection.

Mr. Kunz has been employed as an environmental consultant since receiving his bachelor's degree in human ecology from Cook College, Rutgers University. He is certified as a Senior Ecologist by the Ecological Society of America, as a Professional Wetland Scientist by the Society of Wetland Scientists, and as a Wetland Delineator by the Baltimore District, Army Corps of Engineers. Mr. Kunz has worked with Dr. Schmid on many projects for more than 35 years.

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**Table A. Wetlands Within 150 Feet of Proposed Franklin Loop 42" D Pipeline, Transco Williams Leidy Southeast, Monroe and Luzerne Counties, Pennsylvania**

Wetland ID No.	Mile Post	Corridor Area (acres)	Direct Impact (acres)	Significant Segment Outside ROW	NWI Vegetation Class per NWI (existing conditions, mapped types)	NWI Class per Schmid (existing conditions, whole wetland)	NWI Class per Applicant (all existing or only disturbed part?)	Isolated per Applicant	Abutting Stream Directly per Applicant	Surface Connection to Stream per Applicant	Work < 50 feet of Remainder	Tiny Fragments Left Uncounted	Maintain Only Wet Herbs <25 feet (Conversion)
<b>Monroe County (31 numbered wetlands)</b>													
007-006	54.55	0.08	0.08		ns	PEM	PEM	X			(X)		
007-007	57.48	0.01	0.01		ns	PEM	PEM	(X)			(X)		
001-012	58.4	0.09	0.01	?	ns	PFO, PEM	PEM		Tunk.Ck.		X	X	
001-013	58.53	0.21	0.06		ns	PFO/PSS/PEM	PFO	X			X		0.01
001-017	58.66	0.05			ns	PSS/PEM/POW	PEM			Tunk.Ck.			
001-015	58.76	0.1			ns	PSS/PEM	PEM	X			X		
<b>001-014</b>	58.86	2.35	0.78	X	PSS1E	PFO/PSS/PEM	PSS		Tunk.UNT		X		0.31
001-016	59.05	1.11	0.36	X	ns	PFO/PSS/PEM/POW	PEM	?	?		X		0.17
001-018	59.14	0.08			ns	PFO/PSS/PEM	PEM			Tunk.UNT	X		
001-019	59.18	0.4	0.13	X	ns	PFO/PSS/PEM/POW	PEM		Tunk.UNT		X		
<b>001-020</b>	59.29	3.71	1.16	X	PFO41E, PSS1/EM5E	PFO/PSS/PEM	PSS		Tunk.UNT		X		0.56
001-021	59.63	0.81	0.17		ns	PSS/PEM/PFO	PEM		Tunk.UNT		X		0.05
<b>001-028</b>	59.77	14.45	4.27	X	PFO4BA, PSS1/EM5BA	PFO/PSS/PEM	PSS		Tob.UNT		X		2.37
001-029	60.23	0.26			ns	PSS/PEM	PEM	X			X		
001-030	60.54	0.34	0.17		ns	PFO/PSS/PEM	PEM,PFO	X			X		0.06
001-022	61.07	0.47	0.22		PFO1E	PFO/PSS/PEM	PEM			Tob.Ck.	X		
001-023	61.17	0.18			ns	PEM/POW	PEM		Tob.UNT		X		
001-024	61.24	0.35	0.28		ns	PEM	PEM		Tob.UNT		X		
001-025	61.64	1.05	0.49		ns	PEM	PEM		Tob.UNT		X		
001-026	62.11	0.17	0.17		ns	PEM	PEM	X			(X)		
001-027	62.32	1.21	0.39		ns	PFO/PSS/PEM	PEM,PFO			Tob.UNT	X		
<b>001-031</b>	62.83	3.13	1.1	X	PSS1E, PFO4E	PFO/PSS/PEM	PEM		Two Mile Ck.		X	X	0.21
001-032	63.43	0.55	0.2		ns	PFO/PSS/PEM	PEM,PFO			Two Mile Ck.	X		0.07
001-033	63.56	0.04				POW	PEM		Sto.UNT		X		
001-034	63.67	0.12		X	PUBHh	POW	PEM		Stony Run				
001-035	63.78	0.31	0.08		ns	PSS/PEM	PEM		Stony Run		X		
<b>001-036</b>	64.14	17.27	3.24	X	PFO4E, PEM5E, PFO1E, PSS1E, PFO4/SS1E	PFO/PSS/PEM	PSS	?	?	?	X		1.6
007-002	64.93	0.45	0.16	X	ns	PFO	PEM		Leh.UNT		X		0.06
001-037	64.94	0.66		X	ns	PFO/PSS/PEM	PSS		Leh.UNT		X		
006-003	65.26	0.02	0.01		ns	PEM	PEM	X			X	X	
001-038	65.43	0.65	0.11		ns	PFO/PSS/PEM	PEM			Lehigh R.	X		
<b>Luzerne County (18 numbered wetlands)</b>													
<b>001-039</b>	65.49	0.94	0.59		ns	PFO, PEM	PEM	?	?	?	X	X	0.15
006-001	65.58	0.05			ns	PFO	PFO	X					
001-040	65.89	2.56	0.73	X	ns	PFO, PEM	PEM, PFO		Leh.UNT		X	X	0.22
001-041	66.81	1.02	0.35		ns	PFO, PSS/PEM	PEM		Kend.UNT		X		
001-042	66.87	0.31		X	PFO1E	PFO	PFO			Kend.UNT			
007-009	66.95	0.32	0.12		ns	PEM/POW	PEM	X			X		
<b>009-002</b>	67.05	1.99	0.56	X	PFO1E	PFO	PEM		Kendall Ck.		X		0.16
001-043	67.06	1.39	0.26	X	PFO1E	PFO, PEM	PEM	X			X		
009-001	67.85	1	0.21	X	PSS1E	PSS, PFO	PEM		Sto.UNT		X		
001-044	68.08	0.14			ns	PFO	PEM	?	?	?	X		
001-047	68.12	0.35	0.21		ns	PEM, PFO	PEM		Sto.UNT		X	X	
001-048	68.24	0.02			ns	PEM	PEM			Sto.UNT			
001-049	68.35	0.13			ns	POW, PFO	PEM			Sto.UNT	X		
001-050	68.45	0.45	0.33		ns	PEM	PEM	?	?	?	X		
001-046	68.72	0.11	0.03		ns	PFO	PSS	X			X		
001-045	68.82	0.24	0.22		ns	PEM	PEM	X			X	X	
006-004	68.83	0.04	0.04		ns	PEM, PFO	PEM	X			X		
013-001	68.95	0.07	0.07		ns	PEM, PFO	PEM, PFO	(X)			X	X	
<b>Total 49</b>		<b>61.81</b>	<b>17.37</b>								<b>44 (90%)</b>		<b>6</b>
Boldface = Proposed Direct Disturbance > 0.5 acre													
ns = Not Shown by National Wetland Inventory													
(X) = Wetland to be Completely Disturbed as Well as Surroundings or Isolated but not determined by Applicant													
? = Probably Isolated or significant segment outside ROW, but no information from Applicant													

**Table B. Wetlands Impacted Directly by Proposed Franklin Loop 42" D Pipeline, Transco Williams Leidy Southeast Expansion, Monroe and Luzerne Counties, Pennsylvania**

Wetland ID No.	Mile Post	Applicant Claimed NWI Class	Schmid NWI Class (Existing)	Applicant PA Wetland Class	PA Wetland EV Criteria Met	Applicant Total Wet. Disturbance (acres)	Applicant's Tree Line	Claimed PEM (acres)	Direct PFO Perm. (acres)	Impacts				Schmid Estimated Direct Impacts			
										PFO Temp. (acres)	PSS Temp. (acres)	PEM (acres)	PFO Perm. (acres)	PFO Temp.(?) (acres)	PSS T & P. (acres)		
<b>Monroe County</b> (23 numbered wetlands)																	
007-006	54.55	PEM	PEM	O		0.08		0.08					0.08				
007-007	57.48	PEM	PEM	O		0.01		0.01					0.01				
001-012	58.41	PEM	PFO, PEM	O		0.01		0.01					0.01				
001-013	58.54	PFO	PFO/PSS/PEM	O		0.06	Tree Line		0.02	0.04					0.06		
001-014	58.86	PSS	PFO/PSS/PEM	EV	BT, P	<b>0.78</b>	Tree Line				0.78			0.06	0.23		0.49
001-016	58.99	PEM	PFO/PSS/PEM	O	BT, P	0.36	Tree Line	0.36					0.2	0.04	0.12		
001-019	59.18	PEM	PFO/PSS/PEM/POW	O	BT	0.13	Tree Line	0.13					0.13				
001-020	59.29	PSS	PFO/PSS/PEM	EV	BT, WS	<b>1.16</b>	Tree Line				1.16		0.53	0.11	0.52		
001-021	59.63	PEM	PSS/PEM/PFO	O	BT	0.17	Tree Line	0.17					0.16	0.01			
001-028	59.76	PSS	PFO/PSS/PEM	EV	BT	<b>4.27</b>	Tree Line				4.27		0.16	0.47	1.89		1.91
001-030	60.54	PEM/PFO	PFO/PSS/PEM	O		0.17	Tree Line	0.02	0.04	0.11			0.01	0.03	0.13		
001-022	61.07	PEM	PFO/PSS/PEM	O		0.22	Tree Line	0.22					0.22				
001-024	61.25	PEM	PEM	O		0.28		0.28					0.28				
001-025	61.64	PEM	PEM	O		0.49		0.49					0.49				
001-026	62.11	PEM	PEM	O		0.17		0.17					0.17				
001-027	62.32	PEM/PFO	PFO/PSS/PEM	O		0.39	Tree Line	0.36		0.03			0.34		0.05		
001-031	62.83	PEM	PFO/PSS/PEM	O		<b>1.1</b>	Tree Line	1.1					0.7	0.08	0.32		
001-032	63.43	PEM/PFO	PFO/PSS/PEM	O		0.2	Tree Line	0.18		0.02			0.1		0.08		0.02
001-035	63.74	PEM	PSS/PEM	O		0.08		0.08					0.04				0.04
001-036	64.14	PSS	PFO/PSS/PEM	EV	BT	<b>3.24</b>	Tree Line				3.24						3.24
007-002	64.93	PEM	PFO	O	BT?, S	0.16	Tree Line	0.16					0.02		0.14		(0.74 Perm.)
006-003	65.26	PEM	PEM	O		0.01		0.01					0.01				
001-038	65.43	PEM	PFO/PSS/PEM	O	S	0.11	Tree Line	0.11					0.08		0.03		
<b>Luzerne County</b> (13 numbered wetlands)																	
001-039	65.49	PEM	PFO/PEM	O	S	<b>0.59</b>	Tree Line	<b>0.59</b>					0.14	0.02	0.33		0.1
001-040	65.89	PEM/PFO	PFO/PEM	O	S	<b>0.73</b>	Tree Line	0.5	0.03	0.2			0.32	0.03	0.38		
001-041	66.81	PEM	PEM/PFO/PSS	O	S	0.35	Tree Line	0.35					0.29		0.06		
007-009	66.95	PEM	POW/PEM	O		0.12	Tree Line	0.12							0.03		0.09
009-002	67.05	PEM	PFO	O	S	<b>0.56</b>	Tree Line	0.56					0.06		0.5		
001-043	67.06	PEM	PFO/PEM	O		<b>0.26</b>		0.26					0.26				
009-001	67.85	PEM	PEM/PSS	EV	S	0.21	Tree Line	0.21					0.1		0.11		
001-047	68.12	PEM	PEM/PFO	O		0.21		0.21					0.21				
001-050	68.45	PEM	PEM	O	WS?	0.33		0.33					0.33				
001-046	68.72	PSS	PFO	O		0.03	Tree Line				0.03				0.03		
001-045	68.82	PEM	PEM	O		0.22		0.22					0.22				
006-004	68.83	PEM	PEM/PFO	O		0.04		0.04						0.04			
013-001	68.95	PEM/PFO	PEM/PFO	O		0.07		0.01	0.06				0.01		0.06		
<b>Total 36 numbered wetlands directly impacted</b>						<b>17.37</b>		<b>7.34</b>	<b>0.15</b>	<b>0.4</b>	<b>9.48</b>	<b>5.52</b>	<b>0.95</b>	<b>5.01</b>	<b>5.89</b>	<b>17.37</b>	
				<b>5 EV</b>	<b>15 EV</b>		21 forest or scrub wetlands disturbed	42%	1%	2%	55%	75%	633%	1275%	62%	100%	
58 discrete wetland parcels mapped by applicant					9% of ROW total 183.89 acres disturbed		Applicant claims 11 forest or scrub wetlands disturbed	Wetland Classes: EV = Exceptional Value; O = Other									
13 numbered wetlands in ROW not directly disturbed, per Applicant																	
Construction extends to edge of several "undisturbed" wetlands but damage not mentioned (no buffers)																	

Table C. Significance of Impacts by Wetland, Proposed Franklin Loop, 42" Pipeline D, Williams Transco Leidy Southeast Expansion, Pennsylvania									
Wetland ID No.	Mile Post	In-Corridor Area (acres)	Direct Impact (acres)	Unjustified Damage	No Direct Damage Expected	Setback Damage (only)	Minor Concern Damage	Inter-mediate Damage	High Concern Damage
<b>Monroe County (31 numbered wetlands)</b>									
007-006	54.55	0.08	0.08	X					
007-007	57.48	0.01	0.01	X					
001-012	58.4	0.09	0.01					X	
001-013	58.53	0.21	0.06					X	
001-017	58.66	0.05			X				
001-015	58.76	0.1				X			
001-014	58.86	2.35	0.78						X
001-016	59.05	1.11	0.36						X
001-018	59.14	0.08				X			
001-019	59.18	0.4	0.13						X
001-020	59.29	3.71	1.16						X
001-021	59.63	0.81	0.17						X
001-028	59.77	14.45	4.27						X
001-029	60.23	0.26				X			
001-030	60.54	0.34	0.17					X	
001-022	61.07	0.47	0.22				X		
001-023	61.17	0.18				X			
001-024	61.24	0.35	0.28				X		
001-025	61.64	1.05	0.49				X		
001-026	62.11	0.17	0.17				X		
001-027	62.32	1.21	0.39					X	
001-031	62.83	3.13	1.1						X
001-032	63.43	0.55	0.2					X	
001-033	63.56	0.04			X				
001-034	63.67	0.12				X			
001-035	63.78	0.31	0.08				X		
001-036	64.14	17.27	3.24						X
007-002	64.93	0.45	0.16						X
001-037	64.94	0.66				X			(X)
006-003	65.26	0.02	0.01				X		
001-038	65.43	0.65	0.11						X
<b>Luzerne County (18 numbered wetlands)</b>									
006-001	65.58	0.05			X				
001-039	65.49	0.94	0.59						X
001-040	65.89	2.56	0.73						X
001-041	66.81	1.02	0.35						X
001-042	66.87	0.31			X				
007-009	66.95	0.32	0.12						
009-002	67.05	1.99	0.56						X
001-043	67.06	1.39	0.26						X
009-001	67.85	1	0.21						X
001-044	68.08	0.14				X			
001-047	68.12	0.35	0.21					X	
001-048	68.24	0.02			X				
001-049	68.35	0.13				X			
001-050	68.45	0.45	0.33				X		
001-046	68.72	0.11	0.03					X	
001-045	68.82	0.24	0.22				X		
006-004	68.83	0.04	0.04	X					
013-001	68.95	0.07	0.07	X					
<b>Total 49</b>		<b>61.81</b>	<b>17.37</b>	<b>4</b>	<b>5</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>16</b>
17 potential EV wetlands in red (e.g., Applicant's 009-001)				8%	10%	16%	16%	16%	34%
Area of Direct Wetland Disturbance							10%	7%	83%
58 discrete wetland polygons delineated by Applicant									
Applicant tallied only direct damage									
Wetland Area Direct Disturbance							1.64	1.07	14.46
Total Wetland Area in Corridor				0.2	0.47	1.67	3.42	2.86	53.19
(X) = possible high concern area, currently claimed to be affected only by construction in FERC setback									