

*Atlantic Sunrise Project – PA DEP Chapter 105 Joint Permit Application
Transcontinental Gas Pipe Line Company, LLC
Lebanon County*

APPENDIX P -1
RESOURCE-SPECIFIC AVOIDANCE AND MINIMIZATION
MEASURES

Revised April 2017

**Attachment P-1, Appendix P-1
Resource-Specific Avoidance and Minimization Measures
Lebanon County**

Resource Type (Stream or Wetland)	Resource Name	Resource ID	MP	Chapter 93 Classification, Wetland Classification	Stream Type (Perennial, Intermittent, Ephemeral)	Stream Trout Status (Class A Wild Trout, Wild Trout, Trout Stocked)	Cowardin Classification	Limits of Disturbance (LOD) Adjustments	Field Routing Adjustments within 600-foot Wide Corridor*
Stream	UNT to Conewago Creek (WW-T64-4001)	WW-T64-4001	36.95	TSF, MF	Intermittent	Trout Stocked Stream	N/A	LOD has been reduced to 90' to minimize impacts to the portion of WW-T64-4001 that crosses the full width of the construction workspace.	Although this stream is crossed twice and at oblique angles, the stream crossing was field routed to cross in the best possible area given surrounding constraints. Two additional braids of this stream system are avoided by the current alignment. The alignment in this area also allows for a constructible crossing of the PA Turnpike immediately to the east, and avoids crossing an additional stream and large forested wetland (W-T30-4003) in the northwest portion of the routing corridor.
Stream	UNT to Conewago Creek (WW-T30-4003)	WW-T30-4003	37.25	TSF, MF	Ephemeral	Approved Trout Waters, Trout Stocked Stream	R6	LOD has been reduced to 90' to minimize impacts to WW-T30-4003.	The pipeline was routed at this location to provide a perpendicular crossing of stream WW-T30-4003. Additionally, field routing in this area avoided a large PFO wetland (W-T30-4003) in the northwest portion of the routing corridor and a rocky, forested side slope that would have likely required additional workspace and timber clearing.
Wetland	N/A	W-T96-4003A/ W-T96-4003C	37.53	None	N/A	N/A	PEM, PFO	LOD has been reduced from 100 ft. to 90 ft. to reduce impact to W-T96-4003A & eliminate impact to W-T96-4003C. This wetland does not cross the entire LOD, but portions of the wetland encroach within the northern and southern ends of the construction workspace. Both sides of the LOD were reduced by 10' to minimize impacts to W-T96-4003. This LOD reduction resulted in elimination of impacts to the forested portion of the wetland (W-T96-4003C).	The pipeline was routed in this location to minimize impacts to the forested portion of the wetland (which were ultimately avoided by LOD reduction).
Stream	Conewago Creek (WW-T30-4002)	WW-T30-4002	37.54	TSF, MF	Perennial	Approved Trout Waters, Trout Stocked Stream	R3	LOD has been reduced to 90' to minimize impacts to WW-T30-4002.	The pipeline was routed in this location to avoid the meandering portion of the stream and cross the stream, adjacent rail trail, and roadway at a perpendicular angle.
Wetland	N/A	W-T11-4004	37.85	None	N/A	N/A	PEM	LOD has been reduced to 75' to minimize impacts to W-T11-4004.	This crossing was not significantly changed during field routing. This wetland is a disturbed agricultural ditch/swale and is crossed at a roughly perpendicular angle.
Wetland	N/A	W-T11-4003	38.51	None	N/A	N/A	PEM	This wetland encroaches within the western portion of the LOD only, and this portion of the LOD was reduced by 10' to minimize impacts to W-T11-4003.	The pipeline was routed in this location to follow a property line and avoid impacting interior row crops.
Wetland	N/A	W-T18-4003	38.61	None	N/A	N/A	PEM	This wetland encroaches within the western portion of the LOD only, and this portion of the LOD was reduced by 10' to minimize impacts to W-T18-4003.	The pipeline was routed in this location to follow a property line and avoid impacting interior row crops.
Wetland	N/A	W-T11-4002	38.72	None	N/A	N/A	PEM	The LOD for W-T11-4002 has been modified to eliminate impacts.	This feature is no longer impacted based on LOD reductions.
Stream	UNT to Little Conewago Creek (WW-T18-4002)	WW-T18-4002	38.82	TSF, MF	Ephemeral	None	R6	The LOD for WW-T18-4002 has been modified to eliminate impacts.	This feature is no longer impacted based on LOD reductions.
Stream	UNT to Conewago Creek (WW-T43-4001)	WW-T43-4001	M-0300 0.05	TSF, MF	Ephemeral	Approved Trout Waters, Trout Stocked Stream	R6	The LOD for WW-T43-4001 has been modified to eliminate impacts.	This feature is no longer impacted based on LOD reductions.
Stream	UNT to Little Conewago Creek (WW-T53-4001)	WW-T53-4001	M-0300 0.32	TSF, MF	Perennial	None	N/A	LOD has been reduced to 75' to minimize impacts to WW-T53-4001.	The pipeline was routed at this location to provide a perpendicular crossing of stream WW-T53-4001, and to minimize wetland impacts as noted for W-T32-4001.
Wetland	N/A	W-T32-4001	M-0300 0.32	None	N/A	N/A	PEM	LOD has been reduced to 75' to minimize impacts to W-T32-4001.	The pipeline was routed in this location to cross the wetland in a non-forested area and at a perpendicular angle at its narrowest point in the routing corridor. The crossing occurs in an area of the wetland that is cleared for pasture. The wetland becomes forested to the west and widens significantly to the east.
Wetland	N/A	W-T13-4001	40.55	None	N/A	N/A	PFO	N/A - see field routing notes	The pipeline route was shifted east to avoid this wetland entirely.
Stream	Little Conewago Creek (WW-T13-4001)	WW-T13-4001	40.55	Assumed 50 Feet	N/A	N/A	N/A	N/A - see field routing notes	The pipeline route was shifted east to avoid this stream entirely.

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Stream	UNT to Little Conewago Creek (WW-T13-4002)	WW-T13-4002	41.07	TSF, MF	Intermittent	None	R4	LOD has been reduced to 90' to minimize impacts to WW-T13-4002.	The pipeline route was shifted roughly 300' to the east between MP 40.2 and 41.5 during field routing to avoid several forested wetlands, including W-T13-4001, an emergent wetland (W-T13-4001), and a cabin. Avoidance of these features requires the crossing of stream WW-T13-4002 along the proposed alignment.
Stream	UNT to Little Conewago Creek (WW-T13-4002A)	WW-T13-4002A	41.06	TSF, MF	Ephemeral	None	R6	LOD has been reduced to 90' to minimize impacts to WW-T13-4002.	The pipeline route was shifted roughly 300' to the east between MP 40.2 and 41.5 during field routing to avoid several forested wetlands, including W-T13-4001, an emergent wetland (W-T13-4001), and a cabin. Avoidance of these features requires the crossing of stream WW-T13-4002A along the proposed alignment.
Stream	UNT to Little Conewago Creek (WW-T13-4005)	WW-T13-4005	41.13	TSF, MF	Perennial	None	R3	LOD has been reduced to 90' to minimize impacts to WW-T13-4005.	The pipeline route was shifted roughly 300' to the east between MP 40.2 and 41.5 during field routing to avoid several forested wetlands, including W-T13-4001, an emergent wetland (W-T13-4001), and a cabin. Avoidance of these features requires the crossing of stream WW-T13-4005 along the proposed alignment.
Wetland	N/A	W-T13-4005	41.17	None	N/A	N/A	PEM	The LOD for W-T13-4005 has been modified to eliminate impacts.	This feature is no longer impacted based on LOD reductions.
Wetland	N/A	W-T13-4004	M-0436 0.07	None	N/A	N/A	PFO	The LOD for W-T13-4004 has been modified to eliminate impacts.	This feature is no longer impacted based on LOD reductions.
Stream	UNT to Little Conewago Creek (WW-T13-4004)	WW-T13-4004	M-0470 0.08	TSF, MF	Perennial	None	R3	WW-T13-4004 is being crossed via conventional bore.	The pipeline was routed in this location to provide a safe and effective conventional bore crossing of WW-T13-4004.
Wetland	N/A	W-T13-4002	41.93	None	N/A	N/A	PSS	This wetland encroaches within the western portion of the LOD only, and this portion of the LOD was reduced by 10' to minimize impacts to W-T13-4002.	The pipeline was field routed in this location to avoid crossing at the confluence of WW-T13-4003A and WW-T13-4003 in the western end of the routing corridor. Further shift to the east to avoid this wetland was not possible due to steep side slopes.
Stream	UNT to Gingrich Run (WW-T13-4003)	WW-T13-4003	41.92	TSF, MF	Perennial	None	R3	LOD has been reduced to 90' to minimize impacts to WW-T13-4003.	The pipeline was routed in this location to avoid crossing at the confluence of WW-T13-4003A and WW-T13-4003 in the western end of the routing corridor. Further shift to the east to avoid this stream was not possible due to steep side slopes.
Stream	UNT to Gingrich Run (WW-T33-4001)	WW-T33-4001	42.03	TSF, MF	Ephemeral	None	R6	LOD has been reduced to 90' to minimize impacts to WW-T13-4001.	The pipeline was routed in this location to cross this stream at a perpendicular angle and to avoid a barn that is under construction west of MP 42.1.
Wetland	N/A	W-T43-4001	42.04	None	N/A	N/A	PEM	This wetland encroaches within the eastern portion of the LOD only, and this portion of the LOD was reduced by 10' to minimize impacts to W-T43-4001.	The pipeline was routed in this location to cross this wetland at a perpendicular angle and to avoid a barn that is under construction west of MP 42.1.
Stream	Gingrich Run (WW-T64-5001)	WW-T64-5001	42.58	TSF, MF	Perennial	None	N/A	LOD has been reduced to 90' to minimize impacts to WW-64-5001.	The pipeline was routed in this location to provide a perpendicular crossing of stream WW-T64-5001.
Stream	Quittapahilla Creek (WW-T43-5003)	WW-T43-5003	M-0183-1.32	TSF, MF	Perennial	Approved Trout Waters, Trout Stocked Stream	R3	LOD has been reduced to 90' to minimize impacts to WW-T43-5003.	The pipeline was routed in this location to cross this meandering stream at a perpendicular angle, and to avoid a braided portion of this stream in the southeastern portion of the routing corridor. The route was also routed to avoid a large forested wetland in the northwestern portion of the routing corridor.
Wetland	N/A	W-T43-5004	M-0183-1.35	None	N/A	N/A	PEM	LOD has been reduced to 75' to minimize impacts to W-T43-5004.	The pipeline was routed in this location to cross this wetland at a perpendicular angle, and to avoid a braided portion of the adjacent stream WW-T43-5004 in the southeastern portion of the routing corridor. The route was also routed to avoid a large forested wetland in the northwestern portion of the routing corridor.

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Wetland	N/A	W-T43-5003	M-0183-1.55	None	N/A	N/A	PEM	This wetland encroaches within the southern portion of the LOD only, and this portion of the LOD was reduced by 25' to minimize impacts to W-T43-5003.	The pipeline was routed in this location to cross this wetland at a perpendicular angle and at its northern margin. The alignment also avoids wetland W-T43-5003-1 entirely (north of the LOD) and maintains an acceptable distance from a nearby residence (north of the LOD).
Stream	UNT to Quittapahilla Creek (WW-T43-5001)	WW-T43-5001	M-0183-1.60	TSF, MF	Intermittent	Approved Trout Waters	R4	LOD has been reduced to 80' to minimize impacts to WW-T43-5001.	The pipeline was routed in this location to minimize impacts to an adjacent stream to the south that runs parallel to the LOD. Further avoidance of stream impacts in this area was not possible due to a residence in the northern portion of the routing corridor
Wetland	N/A	W-T14-5002	47.88	None	N/A	N/A	PEM	This wetland encroaches within the eastern portion of the LOD only. Reduction of this portion of the LOD was not possible due to workspace needed for the adjacent road crossing and steep topography immediately north of the crossing.	The pipeline was routed in this location to cross the wetland at its most narrow point, as it widens significantly in the eastern portion of the routing corridor. Shifting the route further west to further minimize impacts was not possible due to existing structures west of the LOD.
Wetland	N/A	W-T14-5003	48.14	None	N/A	N/A	PEM	This wetland encroaches within the western portion of the LOD only, and this portion of the LOD was reduced by 10' to minimize impacts to W-T14-5003.	The pipeline was routed in this location to avoid a historic foundation west of MP 48.1 and to cross the eastern margin of the wetland. The crossing of this wetland occurs between the historic foundation to the west and a north to south running stream to the east. Moving the pipeline further east to avoid impacting wetland W-T14-5003 would cause parallel impacts to the forested riparian corridor and floodway of this stream.
Stream	UNT to Swatara Creek (WW-T14-5003)	WW-T14-5003	48.14	WWF, MF	Intermittent	None	R4	LOD has been reduced to 90' to minimize impacts to WW-T14-5003.	The pipeline was routed in this location to avoid a historic foundation west of MP 48.1 and to cross the stream at a perpendicular angle.
Stream	UNT to Swatara Creek (WW-T14-5004)	WW-T14-5004	48.55	WWF, MF	Perennial	None	R3	LOD has been reduced to 90' to minimize impacts to WW-T14-5004.	The pipeline was routed in this location to provide a perpendicular crossing of stream WW-T14-5004, and to avoid impacting wetland W-T14-5004 immediately south of the LOD.
Wetland	N/A	W-T14-5005A/ W-T14-5005C	48.77	None	N/A	N/A	PEM, PFO	LOD has been reduced to 75' to minimize impacts to W-T14-5005.	The pipeline was routed in this location to avoid impacting the forested portion of the wetland as much as possible, and to cross the adjacent stream at a 90 degree angle.
Stream	UNT to Swatara Creek (WW-T14-5005)	WW-T14-5005	48.78	WWF, MF	Perennial	None	R3	LOD has been reduced to 75' to minimize impacts to WW-T14-5005.	The pipeline was routed in this location to provide a perpendicular crossing of stream WW-T14-5005.
Stream	Swatara Creek (WW-T14-5006)	WW-T14-5006	49.30	WWF, MF	Perennial	None	R3	The full LOD and additional workspace is needed at this crossing due to the size of the crossing and Aid to Navigation (ATON) requirements.	The original alignment in this area was adjusted during field routing to move this stream crossing roughly 600' north and downstream. This realignment significantly reduces tree clearing in riparian/floodplain areas; and entirely avoids wetland W-T14-5006 and a large forested floodplain wetland (W-T14-5007).
Stream	UNT to Swatara Creek (WW-T14-5006A)	WW-T14-5006A	49.34	WWF, MF	Intermittent	None	R4	A portion of the LOD has been reduced to 90' to minimize impacts to WW-T14-5006A.	The pipeline was routed in this location to avoid impacts to riparian buffer and wetlands, as described for wetland WW-T14-5006. Please also note that WW-T14-5006A is an entirely subsurface pipe draining the field and road to the east. This was called a stream at the request of PADEP during site visits due to the possibility that a natural surface channel once existed in the area and has since been buried/channeled underground.
Wetland	N/A	W-T14-5008A	50.07	None	N/A	N/A	PEM	LOD has been reduced to 90' to minimize impacts to W-T14-5008A. Further LOD reduction was not possible due to steep terrain immediately adjacent to the crossing.	The pipeline was routed in this location to cross the narrowest section of the wetland; avoid the forested portion of the wetland in the eastern portion of the routing corridor; and to avoid braided and meandering areas of the adjacent stream WW-T14-2007 occurring just east and west of the current crossing. .
Stream	UNT to Swatara Creek (WW-T14-5007)	WW-T14-5007	50.06	WWF, MF	Intermittent	None	R4	LOD has been reduced to 90' to minimize impacts to WW-T14-5007.	The pipeline was routed in this location to provide a perpendicular crossing of stream WW-T14-5007.

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Stream	UNT to Swatara Creek (WW-T99-5008A)	WW-T99-5008A	50.50	WWF, MF	Perennial	None	R3	LOD has been reduced to 90' to minimize impacts to WW-T99-5008A.	The pipeline was routed in this location to provide a perpendicular crossing of stream WW-T99-5008A.
Stream	UNT to Swatara Creek (WW-T14-5008)	WW-T14-5008	50.53	WWF, MF	Perennial	None	R3	LOD has been reduced to 75' to minimize impacts to WW-T14-5008.	The pipeline was routed in this location to provide a perpendicular crossing of stream WW-T14-5008, and to avoid impacting wetlands W-T-14-15010-2 and W-T14-15010-3, and pond WB-T14-5003.
Wetland	N/A	W-T14-5010-1	50.53	None	N/A	N/A	PEM	LOD has been reduced to 75' to minimize impacts to W-T14-5010-1.	The pipeline was routed in this location to provide a perpendicular crossing of wetland W-T14-5010-1, and to avoid impacting wetlands W-T-14-15010-2 and W-T14-15010-3, and pond WB-T14-5003.
Stream	UNT to Swatara Creek (WW-T14-5009A)	WW-T14-5009A	51.21	WWF, MF	Perennial	None	R3	LOD has been reduced to 90' to minimize impacts to WW-T14-5009A.	The pipeline was routed in this location to avoid placing a PI in the stream channel. Additionally, the working side of the workspace (i.e., the wider side) was flipped to the west of the pipeline in this area in order limit tree removal and to keep disturbance on level open ground as far west as possible of wetlands W-T14-5011 and wetland W-T14-5012, and stream WW-T14-5009 that are located in a woodland east and downslope of the current alignment.
Wetland	N/A	W-T32-5001	M-0423 0.12	None	N/A	N/A	PEM	The LOD for W-T32-5001 has been modified to eliminate impacts.	This feature is no longer impacted based on LOD reductions.
Stream	UNT to Swatara Creek (WW-T44-5001)	WW-T44-5001	M-0423 0.12	WWF, MF	Intermittent	None	R4	LOD has been reduced to 90' to minimize impacts to WW-T44-5001.	The pipeline was routed in this location to provide a perpendicular crossing of stream WW-T44-5001.
Wetland	N/A	W-T14-5014	52.64	None	N/A	N/A	PEM	This wetland encroaches within the eastern portion of the LOD only, and this portion of the LOD was reduced by 10' to minimize impacts to W-T14-5014.	The pipeline was routed at this location to cross the narrowest section of the wetland at its western margin.
Stream	UNT to Reeds Creek (WW-T14-5010)	WW-T14-5010	52.65	WWF, MF	Intermittent	None	R4	LOD has been reduced from 100 ft. to 90 ft. to reduce impact to stream WW-T14-5010.	The pipeline was routed at this location to cross the narrowest portion of riparian forest corridor.
Stream	UNT to Reeds Creek (WW-T14-5011)	WW-T14-5011	52.77	WWF, MF	Intermittent	None	R4	LOD has been reduced to 90' to minimize impacts to WW-T14-5011.	The pipeline was routed in this location to avoid a network of braided stream channels and forested wetland in the eastern portion of the routing corridor.
Stream	UNT to Reeds Creek (WW-T14-5011A)	WW-T14-5011A	52.78	WWF, MF	Intermittent	None	R4	LOD has been reduced to 90' to minimize impacts to WW-T14-5011A.	The pipeline was routed in this location to avoid a network of braided stream channels and forested wetland in the eastern portion of the routing corridor.
Wetland	N/A	W-T14-5015A	53.04	None	N/A	N/A	PEM, PSS	LOD has been reduced to 75' to minimize impacts to W-T14-5011.	The pipeline was routed in this location to provide a perpendicular crossing of wetland W-T14-5011.
Stream	Reeds Creek (WW-T14-5013)	WW-T14-5013	53.04	WWF, MF	Intermittent	None	R4	LOD has been reduced to 75' to minimize impacts to WW-T14-5013.	The pipeline was routed in this location to provide a perpendicular crossing of stream WW-T14-5013.
Stream	UNT to Reeds Creek (WW-T14-5013A)	WW-T14-5013A	53.05	WWF, MF	Intermittent	None	R4	LOD has been reduced to 75' to minimize impacts to WW-T14-5013A.	The pipeline was routed in this location to provide a perpendicular crossing of stream WW-T14-5013A.
Wetland	N/A	W-T13-6002	53.46	None	N/A	N/A	PEM	LOD has been reduced to 75' to minimize impacts to W-T13-6002.	The pipeline was routed in this location to provide a perpendicular crossing of wetland W-T13-6002. Avoidance of this wetland was not feasible due to the linear nature of the wetland, extending east and west beyond the routing corridor.

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Wetland	N/A	W-T10-6004	53.57	None	N/A	N/A	PEM	LOD has been reduced to 75' to minimize impacts to W-T10-6004.	The pipeline was routed in this location to provide a perpendicular crossing of wetland W-T10-6004.
Stream	UNT to Swatara Creek (WW-T10-6002)	WW-T10-6002	53.68	WWF, MF	Intermittent	None	R4	LOD has been reduced to 90' to minimize impacts to WW-T10-6002.	The pipeline was routed in this location to minimize impacts to the riparian buffer of the stream as much as possible, while avoiding a residence east of the LOD. Larger scale re-routes, outside of the routing corridor, were considered in this area to completely avoid paralleling the stream, but all were rejected due to a number of constraints.
Wetland	N/A	W-T10-6003A / W-T10-6003A-1/ W-T10-6003B	53.75	None	N/A	N/A	PEM, PSS	W-T10-6003A does not extend across the full width of the LOD. Since the wetland width within the LOD is less than 75', the FERC Procedures do not require LOD reduction. In addition, an LOD reduction at this location would only be possible in the adjacent upland area and would not result in minimization of wetland impacts.	The pipeline was routed in this location to cross the eastern margin of wetland W-T10-6003A and to avoid paralleling the adjacent stream as much as possible.
Wetland	N/A	W-T10-6002A W-T10-6002C	M-0388 0.02	None	N/A	N/A	PFO	LOD reduced to 90' to minimize impacts to W-T10-6002. Further LOD reduction was not possible due to presence of a foreign pipeline and adjacent stream. The additional workspace will be used for equipment crossing and spoil storage to accommodate a safe and efficient crossing.	The pipeline was routed in this location to provide a perpendicular crossing of wetland W-T10-6002. Avoidance of this wetland was not feasible due to the linear nature of the wetland, extending east and west beyond the routing corridor.
Stream	UNT to Qureg Run (WW-T40-6004)	WW-T40-6004	M-0388 0.03	WWF, MF	Perennial	None	R3	LOD has been reduced to 90' to minimize impacts to WW-T40-6004.	The pipeline was routed in this location to provide a perpendicular crossing of stream WW-T40-6004.
Wetland	N/A	W-T69-6001	54.95	PEM	N/A	N/A	PEM	W-T69-6001 does not extend across the full width of the LOD. Since the wetland width within the LOD is less than 75', the FERC Procedures do not require LOD reduction. In addition, an LOD reduction at this location would only be possible in the adjacent upland area and would not result in minimization of wetland impacts.	The pipeline was routed at this location to cross the northern margin of the wetland. Further avoidance of this wetland was not feasible due to residences north of the LOD.
Stream	UNT to Qureg Run (WW-T69-6002)	WW-T69-6002	54.99	WWF, MF	Intermittent	None	N/A	LOD has been reduced to 80' to minimize impacts to WW-T69-6002.	The pipeline was routed in this location to provide a perpendicular crossing of stream WW-T69-6002.
Stream	UNT to Qureg Run (WW-T69-6001)	WW-T69-6001	55.05	WWF, MF	Ephemeral	None	N/A	LOD has been reduced to 90' to minimize impacts to WW-T69-6001.	The pipeline was routed in this location to provide a perpendicular crossing of stream WW-T69-6001.
Stream	UNT to Qureg Run (WW-T40-6003)	WW-T40-6003	M-0168-0.06	WWF, MF	Intermittent	None	R4	LOD has been reduced to 90' to minimize impacts to WW-T40-6003.	The pipeline was routed in this location to provide a perpendicular crossing of stream WW-T40-6003, and to avoid impacting stream WW-T40-6003A that runs east to west in the southern portion of the routing corridor.
Wetland	N/A	W-T30-6001	55.48	None	N/A	N/A	PFO	W-T30-6001 is being crossed via conventional bore.	The pipeline was routed in this location to provide a safe and effective conventional bore crossing of W-T30-6001.
Stream	UNT to Qureg Run (WW-T30-6004)	WW-T30-6004	55.49	WWF, MF	Perennial	None	R3	WW-T30-6004 is being crossed via conventional bore.	The pipeline was routed in this location to provide a safe and effective conventional bore crossing of WW-T30-6004.
Stream	UNT to Qureg Run (WW-T30-6005)	WW-T30-6005	55.68	WWF, MF	Intermittent	None	R4	LOD has been reduced to 90' to minimize impacts to WW-T30-6005.	The pipeline was routed in this location to provide a perpendicular crossing of stream WW-T30-6005, and to avoid impacting wetland W-T30-6002 and stream WW-T30-6005A in the western portion of the routing corridor.
Wetland	N/A	W-T30-6003	55.92	None	N/A	N/A	PEM	LOD has been reduced to 75' to minimize impacts to W-T30-6003.	The pipeline was routed in this location to provide a perpendicular crossing of wetland W-T30-6003. Avoidance of this wetland was not feasible due to the linear nature of the wetland, extending east and west beyond the routing corridor.
Stream	Forge Creek (WW-T32-6001)	WW-T32-6001	56.28	WWF, MF	Perennial	None	R3	LOD has been reduced to 75' to minimize impacts to WW-T32-6001.	The pipeline was routed in this location to provide a perpendicular crossing of stream WW-T32-6001.

**Attachment P-1, Appendix P-1
Resource-Specific Avoidance and Minimization Measures
Lebanon County**

Resource Type (Stream or Wetland)	Resource Name	Resource ID	MP	Chapter 93 Classification, Wetland Classification	Stream Type (Perennial, Intermittent, Ephemeral)	Stream Trout Status (Class A Wild Trout, Wild Trout, Trout Stocked)	Cowardin Classification	Limits of Disturbance (LOD) Adjustments	Field Routing Adjustments within 600-foot Wide Corridor*
Wetland	N/A	W-T32-6001	56.28	None	N/A	N/A	PEM	LOD has been reduced to 75' to minimize impacts to W-T32-6001.	The pipeline was routed in this location to provide a perpendicular crossing of wetland W-T32-6001. Avoidance of this wetland was not feasible due to the linear nature of the wetland, extending east and west beyond the routing corridor.
Stream	UNT to Forge Creek (WW-T67-6001)	WW-T67-6001	56.62	WWF, MF	Intermittent	None	N/A	LOD has been reduced to 80' to minimize impacts to WW-T67-6001.	The pipeline was routed in this location to avoid the riparian forest buffer of stream WW-T67-6001 in the western portion of the routing corridor.
Wetland	N/A	W-T67-6001	56.62	PEM	N/A	N/A	None	This wetland encroaches within the southern portion of the LOD only, and this portion of the LOD was reduced by 10' to minimize impacts to W-T67-6001.	The pipeline was routed in this location to avoid the riparian forest buffer of adjacent stream WW-T67-6001 in the western portion of the routing corridor.
Wetland	N/A	W-T67-6002	56.69	PEM	N/A	N/A	None	LOD reduced to 75' where the wetland crosses the full width of the LOD. In other areas where the wetland does not extend across the full width of the LOD, reduction of the LOD would only be possible in the adjacent upland area and would not result in further minimization of wetland impacts. LOD was also reduced to avoid impacting an additional portion of this wetland closer to MP 56.8.	The pipeline was routed in this location to primarily impact the southern portion of the wetland only.
Wetland	N/A	W-T40-6001A/ W-T40-6001C	56.84	None	N/A	N/A	PEM, PFO	LOD reduced to 90' to minimize impacts to W-T10-6002. Further LOD reduction was not possible due to adjacent road and stream crossings. The additional workspace will be used for equipment crossing and spoil storage to accommodate a safe and efficient crossing.	The pipeline was routed in this location to utilize an old roadbed within the wetland to limit forested wetland impacts as much as possible. Additional avoidance measures were limited by a residence immediately east of the route, and because the wetland continues well west beyond the routing corridor.
Stream	UNT to Forge Creek (WW-T40-6001A)	WW-T40-6001A	56.89	WWF, MF	Perennial	None	R3	LOD has been reduced to 90' to minimize impacts to WW-T40-6001A.	The pipeline was routed in this location to provide a perpendicular crossing of stream WW-T40-6001A.
Stream	UNT to Forge Creek (WW-T40-6001)	WW-T40-6001	M-0205 0.01	WWF, MF	Perennial	None	R3	LOD has been reduced to 90' to minimize impacts to WW-T40-6001.	The pipeline was routed in this location to provide a perpendicular crossing of stream WW-T40-6001.
Wetland	N/A	W-T53-6001	M-0205-0.38	None	N/A	N/A	PEM	The LOD was modified to eliminate impacts to W-T53-6001	This feature is no longer impacted based on LOD reductions.
Stream	UNT to Trout Run (WW-T43-6003A)	WW-T43-6003A	58.51	CWF, MF	N/A	N/A	N/A	LOD has been reduced to 90' to minimize impacts to WW-T43-6003.	The pipeline was routed in this location to avoid wetlands W-T43-6001 and W-T43-6002, stream WW-T43-6003 (primary drainage for the system), and several seeps contributing to the stream system. Each of these avoided features are located in the eastern portion of the routing corridor.
Wetland	N/A	W-T43-6002	58.51	EV	N/A	N/A	PEM	The LOD was modified to eliminate impacts to W-T43-6002.	This feature is no longer impacted based on LOD reductions.
Stream	UNT to Trout Run (WW-T43-6004)	WW-T43-6004	58.52	CWF, MF	Intermittent	Approved Trout Waters; Trout Stocked Stream; Wild Trout Waters	R4	LOD has been reduced to 90' to minimize impacts to WW-T43-6003.	The pipeline was routed in this location to avoid wetlands W-T43-6001 and W-T43-6002, stream WW-T43-6003 (primary drainage for the system), and several seeps contributing to the stream system. Each of these avoided features are located in the eastern portion of the routing corridor.
Wetland	N/A	W-T23-6002C	58.80	EV	N/A	N/A	PFO	LOD has been reduced to 75' to minimize impacts to W-T23-6002C.	The pipeline was routed in this location to collocate with an existing foreign pipeline. Additional routing options in this area were limited due to a public road and Blue Mountain to the south and residential areas to the east and west of the current alignment. Collocating in this area reduces overall habitat fragmentation through the stream and wetland complex, allows WW-T23-6003 to be crossed at a roughly perpendicular angle, and maintains adequate distance from nearby residences.

**Attachment P-1, Appendix P-1
Resource-Specific Avoidance and Minimization Measures
Lebanon County**

Resource Type (Stream or Wetland)	Resource Name	Resource ID	MP	Chapter 93 Classification, Wetland Classification	Stream Type (Perennial, Intermittent, Ephemeral)	Stream Trout Status (Class A Wild Trout, Wild Trout, Trout Stocked)	Cowardin Classification	Limits of Disturbance (LOD) Adjustments	Field Routing Adjustments within 600-foot Wide Corridor*
Wetland	N/A	W-T23-6002A-2	58.73	EV	N/A	N/A	PEM	W-T23-6002-A-2 does not extend across the full width of the LOD. Since the wetland width within the LOD is less than 75', the FERC Procedures do not require LOD reduction. In addition, an LOD reduction at this location would only be possible in the adjacent upland area and would not result in minimization of wetland impacts.	The pipeline was routed in this location to collocate with an existing foreign pipeline. Additional routing options in this area were limited due to a public road and Blue Mountain to the south and residential areas to the east and west of the current alignment. Collocating in this area reduces overall habitat fragmentation through the stream and wetland complex, allows WW-T23-6003 to be crossed at a roughly perpendicular angle, and maintains adequate distance from nearby residences. Impacts to the small PEM wetland W-T23-6002A-2 are necessary to achieve the previously described collocation benefits.
Stream	Trout Run (WW-T23-6003)	WW-T23-6003	58.75	CWF, MF	Perennial	Approved Trout Waters; Trout Stocked Stream; Wild Trout Waters	R3	LOD has been reduced to 90' to minimize impacts to WW-T23-6003.	The pipeline was routed in this location to provide a perpendicular crossing of stream WW-T23-6003.
Wetland	N/A	W-T33-6001	59.29	EV	N/A	N/A	PEM	This wetland encroaches within the southern portion of the LOD only, and this portion of the LOD was reduced by 20' to minimize impacts to W-T33-6001.	The pipeline was routed at this location to cross the western margin of the wetland, and to avoid impacting stream WW-T33-6001A in the eastern portion of the routing corridor. Additional avoidance measures are limited by residential structures to the east and west.
Stream	UNT to Trout Run (WW-T33-6001)	WW-T33-6001	59.32	CWF, MF	Perennial	Approved Trout Waters; Trout Stocked Stream; Wild Trout Waters	R3	LOD has been reduced to 90' to minimize impacts to WW-T33-6001.	The pipeline was routed in this location to provide a perpendicular crossing of stream WW-T33-6001.
Stream	UNT to Trout Run (WW-T43-6001)	WW-T43-6001	M-0176-0.10	CWF, MF	Perennial	Wild Trout Waters	R3	LOD has been reduced to 90' to minimize impacts to WW-T43-6001.	The pipeline was routed in this location to provide a roughly perpendicular crossing of stream WW-T43-6001. Additionally, the crossing occurs at one of the narrowest nearby areas of the forested riparian corridor.
Stream	UNT to Trout Run (WW-T44-7002)	WW-T44-7002	M-0200-0.27	CWF, MF	Perennial	Wild Trout Waters	R3	LOD has been reduced to 90' to minimize impacts to WW-T44-7002.	The pipeline was routed in this location to provide a perpendicular crossing of stream WW-T44-7002.
Wetland	N/A	W-T44-7001	M-0200-0.30	None	N/A	N/A	PEM	LOD has been reduced to 75' to minimize impacts to W-T44-7001.	The pipeline was routed in this location to avoid impacting seeps and additional stream channels in the southern portion of the routing corridor, and to avoid impacting an additional stream channel in the northern portion of the routing corridor.
Stream	UNT to Swatara Creek (WW-T23-6001)	WW-T23-6001	60.65	CWF, MF	Perennial	Wild Trout Waters (under review)	R3	LOD has been reduced to 90' to minimize impacts to WW-T23-6001.	The pipeline was routed in this location to provide a perpendicular crossing of stream WW-T23-6001.
Wetland	W-T23-6001C	W-T23-6001C	60.66	EV	N/A	N/A	PFO	W-T23-6001C does not extend across the full width of the LOD. Since the wetland width within the LOD is less than 75', the FERC Procedures do not require LOD reduction. In addition, an LOD reduction at this location would only be possible in the adjacent upland area and would not result in minimization of wetland impacts.	The pipeline was routed in this location to avoid braided portions of stream WW-T23-6001, wetland W-T23-6001A, and stream WW-T23-6001B in the northwest portion of the routing corridor. Avoiding this wetland crossing by shifting the route further south was constrained by steep topography.
Stream	UNT to Swatara Creek (WW-T23-6002)	WW-T23-6002	61.12	CWF, MF	Perennial	Wild Trout Waters (under review)	R3	LOD has been reduced to 90' to minimize impacts to WW-T23-6002.	The pipeline was routed in this location to provide a perpendicular crossing of stream WW-T23-6002.
Stream	UNT to Swatara Creek (WW-T20-7002)	WW-T20-7002	61.17	CWF, MF	Perennial	Wild Trout Waters (under review)	R3	LOD has been reduced to 75' to minimize impacts to WW-T20-7002.	The pipeline was routed in this location to provide a perpendicular crossing of stream WW-T20-7002.
Wetland	W-T20-7001	W-T20-7001	61.17	EV	N/A	N/A	PFO	LOD has been reduced to 75' to minimize impacts to W-T20-7001.	The pipeline was routed in this location to avoid a large pond (WB-T23-6001) in the southern portion of the routing corridor.

**Attachment P-1, Appendix P-1
Resource-Specific Avoidance and Minimization Measures
Lebanon County**

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Stream	UNT to Swatara Creek (WW-T20-7001)	WW-T20-7001	61.41	CWF, MF	Perennial	Wild Trout Waters (under review)	R3	LOD has been reduced to 90' to minimize impacts to WW-T20-7001.	The pipeline was routed in this location to provide a perpendicular crossing of stream WW-T20-7001.
Stream	UNT to Swatara Creek (WW-T20-7003)	WW-T20-7003	61.97	CWF, MF	Perennial	Wild Trout Waters (under review)	N/A	LOD has been reduced to 90' to minimize impacts to WW-T20-7003.	The pipeline was routed in this location to provide a perpendicular crossing of stream WW-T20-7003.
Stream	UNT to Swatara Creek (WW-T10-7004)	WW-T10-7004	62.52	CWF, MF	Perennial	Wild Trout Waters (under review)	N/A	LOD has been reduced to 90' to minimize impacts to WW-T10-7004.	The pipeline was routed in this location to provide a perpendicular crossing of stream WW-T10-7004.
Stream	UNT to Swatara Creek (WW-T10-7003)	WW-T10-7003	63.70	CWF, MF	Perennial	Wild Trout Waters (under review)	R3	LOD has been reduced to 90' to minimize impacts to WW-T10-7003.	The pipeline was routed in this location to provide a perpendicular crossing of stream WW-T10-7003, and in the narrowest portion of the riparian forest buffer in the routing corridor.
Stream	UNT to Swatara Creek (WW-T10-7002)	WW-T10-7002	63.93	CWF, MF	Intermittent	Wild Trout Waters (under review)	R4	LOD has been reduced to 90' to minimize impacts to WW-T10-7002.	The pipeline was routed in this location to provide a perpendicular crossing of stream WW-T10-7002.
Stream	UNT to Swatara Creek (WW-T10-7001)	WW-T10-7001	64.07	CWF, MF	Perennial	Wild Trout Waters (under review)	R3	LOD has been reduced to 90' to minimize impacts to WW-T10-7001.	The pipeline was routed in this location to provide a perpendicular crossing of stream WW-T10-7001.

*The FERC Alignment Sheets provided in Attachment H-1 show field delineated streams and wetlands within the 300-foot wide environmental survey corridor, and surrounding land use features on an aerial base map.