2.0 DESCRIPTION OF PROPOSED ACTION

The FERC is the federal agency responsible for authorizing construction and operation of onshore LNG import and interstate natural gas transmission facilities. The Coast Guard is the federal agency responsible for determining the suitability of the waterway for LNG marine traffic and issuing a LOR regarding this issue.

As described previously, AES and Mid-Atlantic Express are seeking:

- authorizations to site, construct, and operate an LNG receiving terminal and associated facilities in Baltimore County, Maryland;
- a Certificate and associated authorizations to construct and operate natural gas pipeline facilities in Baltimore, Harford, and Cecil Counties, Maryland, and in Lancaster and Chester Counties, Pennsylvania; and
- an LOR with conditions from the Coast Guard finding the waterway suitable for LNG vessels.

The following sections describe the proposed LNG terminal and pipeline facilities, land requirements, construction procedures and schedule, environmental compliance and inspection monitoring, operation and maintenance procedures, safety controls, and nonjurisdictional facilities. Alternatives to the proposed Project and the Coast Guard's proposed alternatives are presented in section 3.0.

2.1 PROPOSED PROJECT FACILITIES

The Sparrows Point LNG Project would consist of onshore storage and process facilities, and marine docking and unloading facilities in Baltimore County, Maryland. Also part of this Project is a proposed pipeline, the Mid-Atlantic Express Pipeline, which would transport natural gas to three existing natural gas pipeline systems. The proposed 87.6 mile, 30-inch-diameter natural gas pipeline would extend from the LNG terminal to interconnections with the Columbia Gas Transmission Corporation (Columbia), Transcontinental Gas Pipe Line Corporation (Transco), and Texas Eastern Transmission Corporation (TETCO) interstate pipeline systems near Eagle, Pennsylvania. The pipeline project footprint would be located in the counties of Baltimore, Harford, and Cecil in Maryland, and the counties of Lancaster and Chester in Pennsylvania. The general project location map for the LNG terminal is shown in figure 2.1-1**.** The general project location map for the pipeline is provided in figure 2.1-2.

AES is reviewing the option of adding the construction and operation of a combined cycle cogeneration power plant at the site. If constructed, the power plant would operate on natural gas, and would produce approximately 300 MW of electric power. In this scenario, the excess heat of the power plant would be used to vaporize the LNG at the Project terminal. The commercial viability of this option is currently being studied by AES. This optional power plant is treated as a potential nonjurisdictional facility in this EIS.

2.1.1 LNG Terminal

The LNG terminal facilities would include a ship docking and unloading facility, three full-containment storage tanks, vaporization systems, vapor handling systems, site utilities, administrative and support buildings, instrumentation and control systems, communications and security systems, fire protection, and hazard detection and safety systems. A layout of the proposed facilities is provided on figures 2.1.1-1 and 2.1.1-2. A broader view of the Sparrows Point LNG terminal area is in figure 3.2.3.2.

Figure 2.1-1
Sparrows Point LNG Project
General Project Location

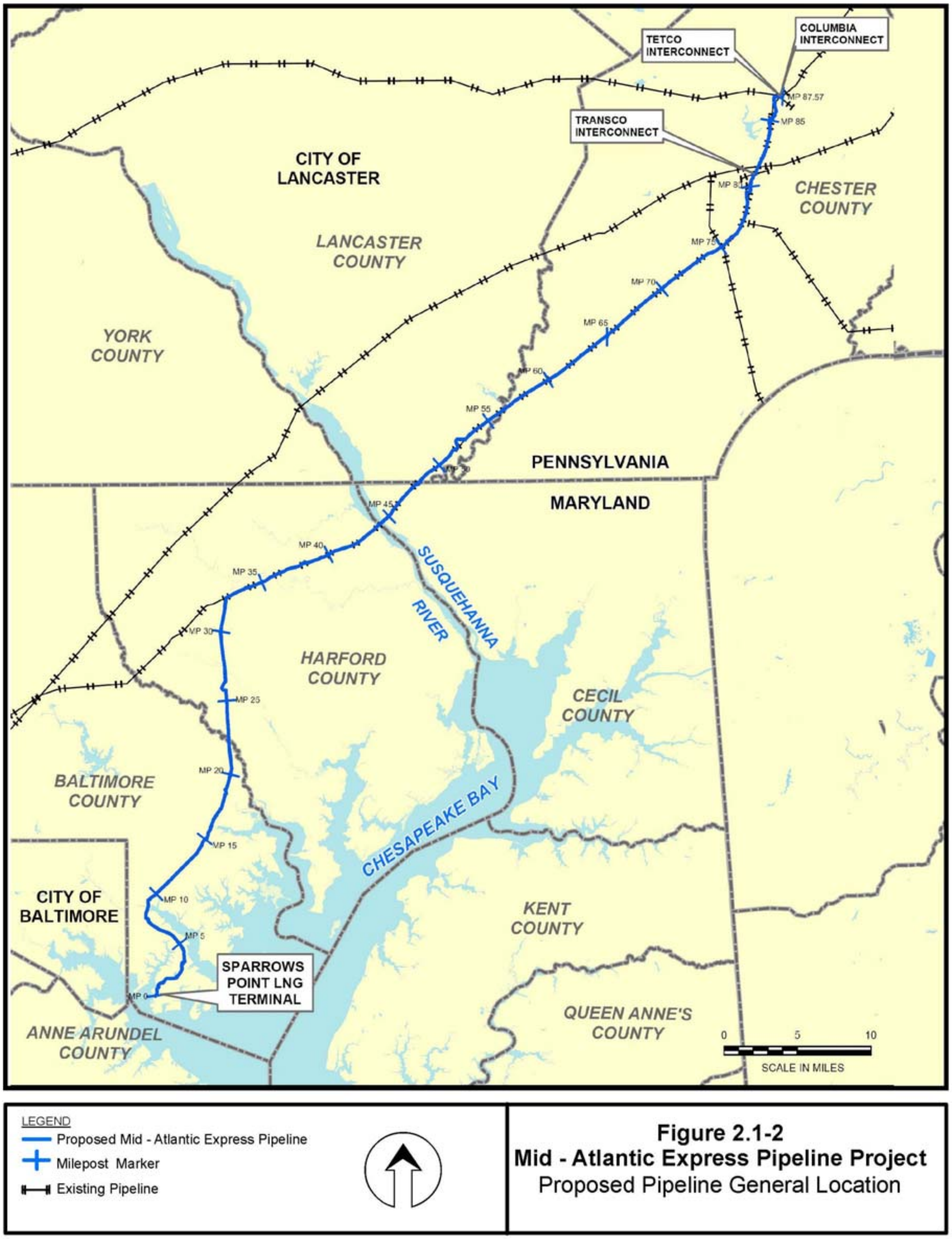


Figure 2.1-2
Mid - Atlantic Express Pipeline Project
Proposed Pipeline General Location

2.1.1.1 Ship Unloading Facility

The proposed LNG ship unloading facility would include the construction, operation, and maintenance of a ship docking facility capable of unloading LNG ships with cargo capacities of 125,000 to 217,000 m^3. The facility would be capable of mooring and offloading one LNG ship at a time, but could handle a second ship either arriving or departing the second berth simultaneously. AES anticipates that a ship every 2 to 3 days (about 120 to 150 ships per year) would call and unload at the proposed import facility.

There would be two separate LNG unloading berths; the southern berth (south of the unloading dock) would be the primary unloading berth, and the northern berth would be an auxiliary or supplemental berth. The berths would share a common LNG unloading platform that would be built on top of an existing concrete, pile-supported pier, currently known as Pier 1. Each berth would have three 16-inch liquid unloading arms. The unloading arms would have full-bore, emergency release couplings (ERCs) at the outboard end of each arm.

LNG would be unloaded from an LNG ship at a rate of 12,500 cubic meters per hour (m^3/hour) into the LNG storage tanks via a single 32-inch-diameter LNG unloading pipeline. The unloading pipeline would be maintained at cryogenic conditions at times when there is no unloading operation by circulating LNG from the LNG storage tank(s) through an LNG circulation pipeline to the berths. Expansion loops would be provided in the circulation pipeline to provide for pipeline expansion and contraction.

AES would design the unloading facility in compliance with applicable codes and standards, including but not limited to: DOT standards under 49 CFR Part 193, and the National Fire Protection Association (NFPA) 59A, Standard for the Protection, Storage, and Handling of Liquefied Natural Gas (LNG), 2001 Edition.

2.1.1.2 LNG Storage Tanks

The Sparrows Point facility would have three identical full containment type tanks with a primary inner containment and a secondary outer containment. The tanks would be designed and constructed so that the self-supporting primary containment and the secondary containment would be capable of independently containing the full volume of LNG. The primary containment, constructed of 9 percent nickel steel, would contain the LNG under normal operating conditions. The secondary containment would be capable of containing the LNG (110 percent capacity of the inner tank contents) and of controlling the vapor resulting from failure of the inner containment. The outside diameter of the outer containment would be approximately 270 feet at the base of each tank, and the height of each tank would be 170 feet.

Each insulated tank would be designed to store a net volume of 160,000 m^3 (1,006,000 barrels) of LNG at a design temperature of -270 degrees Fahrenheit (°F) and a maximum internal pressure of 4.3 pounds per square inch gauge (psig). The space between the sidewalls of the inner and outer containments would be filled with expanded Perlite® insulation that would be compacted to reduce long term settling of the insulation. Base heating would be provided in the foundation to prevent frost heave.

There would be no penetrations through the inner containment or outer containment sidewall or bottom. All piping into and out of the inner or outer containments would enter from the top of the tank. Each tank would be protected against under- and over-pressure by pressure and vacuum relief valves. Each of the LNG storage tanks would have three low-pressure sendout pumps. Each low-pressure pump would be mounted inside its own column and would be located inside the column near the bottom of the LNG storage tank. Each pump would be provided with an individual minimum flow recycle line and flow control to protect the pump from insufficient cooling and bearing lubrication at low flow rates. Additionally, each pump would be remotely monitored for pressure, flow, vibration and motor amperage.

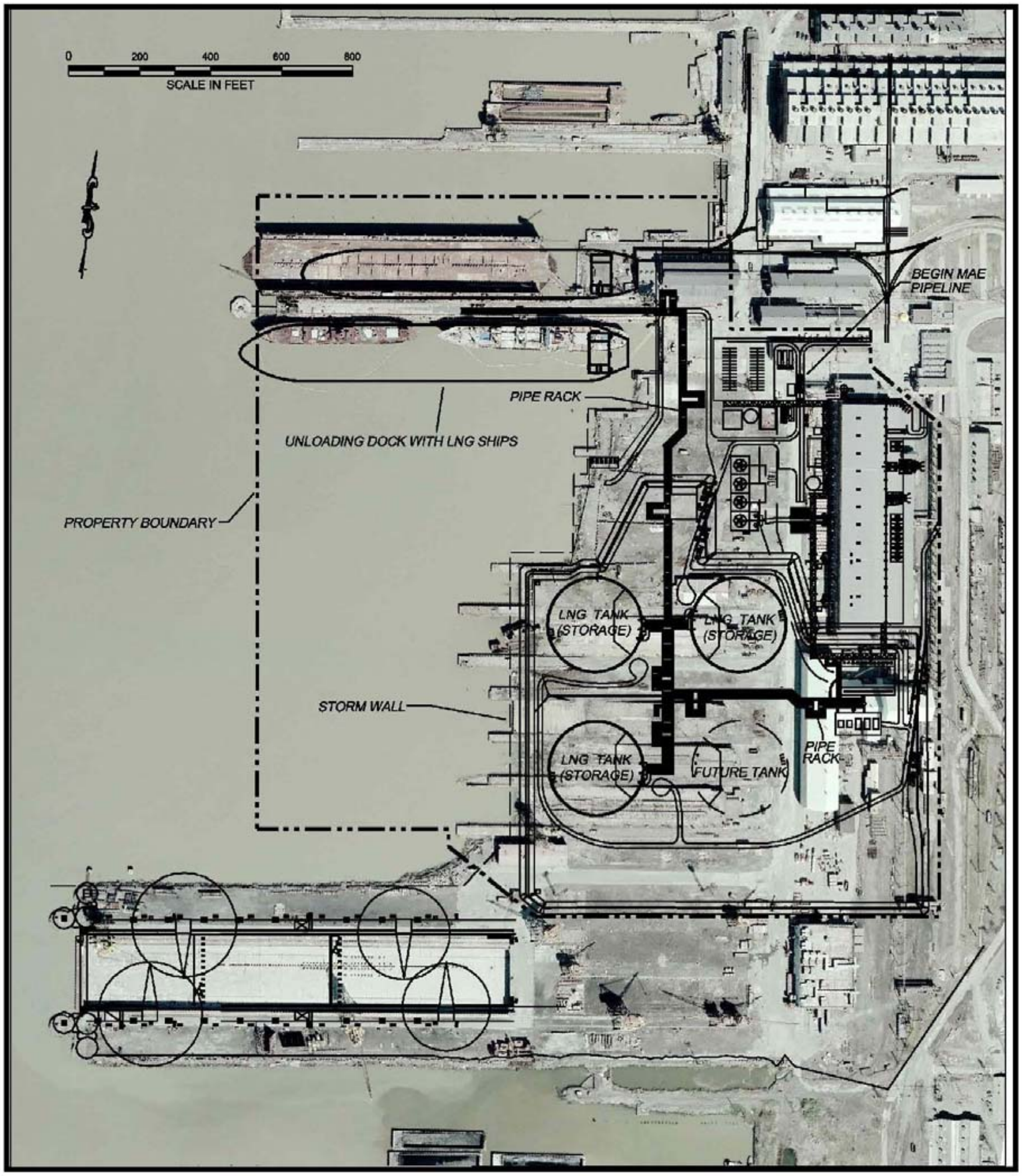


Figure 2.1.1-1
Sparrows Point LNG Project
Terminal Facities Layout

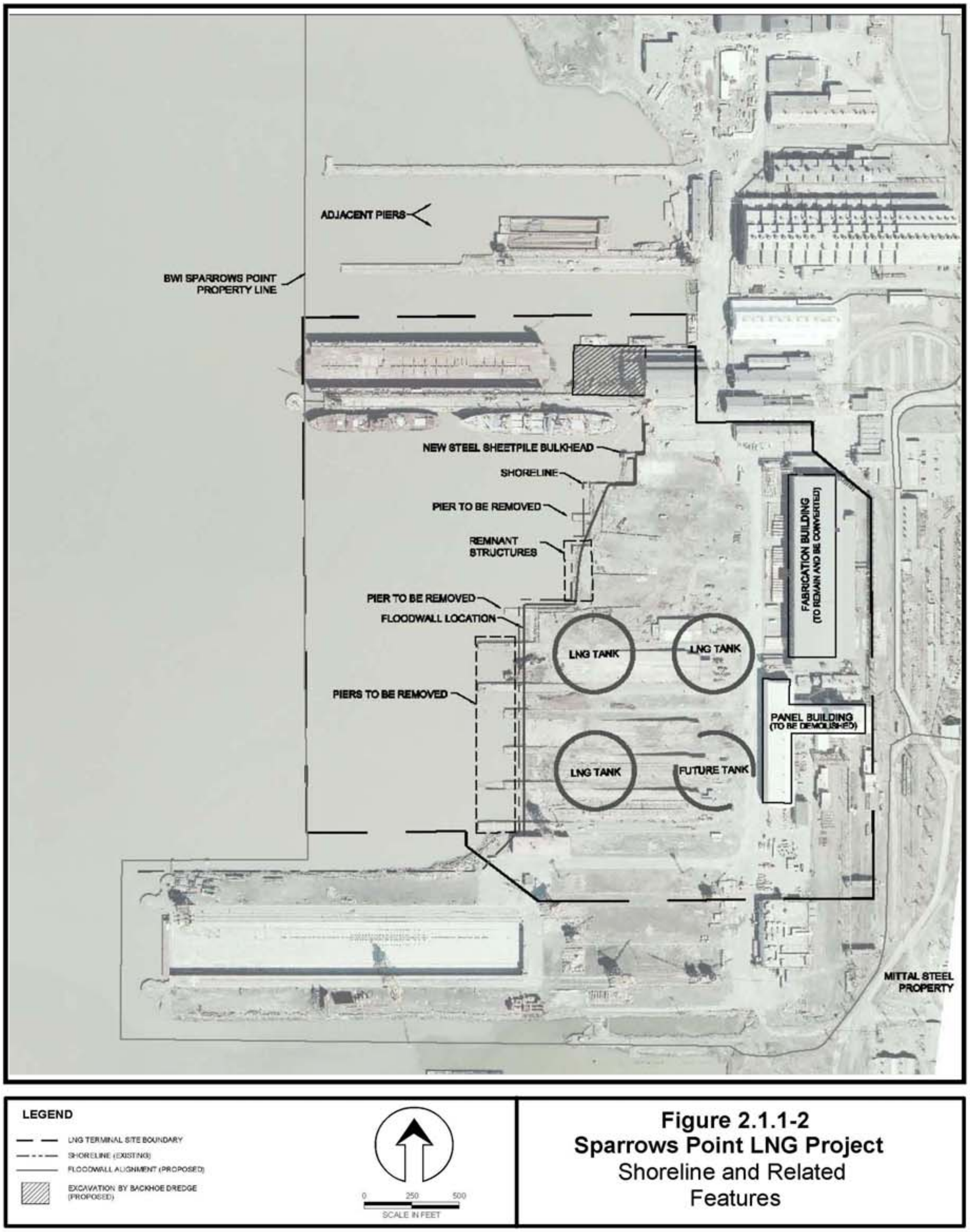


Figure 2.1.1-2
Sparrows Point LNG Project
Shoreline and Related Features

2.1.1.3 Vaporization Systems

There would be two LNG vaporization systems at the LNG terminal: the high pressure (HP) Sendout System and the intermediate pressure (IP) Fuel Gas System. The HP vaporization system would generate the sendout natural gas leaving the Sparrows Point LNG facility. The IP vaporization system would generate the IP fuel gas for supply either to the low pressure (LP) fuel gas system or to the future potential power plant combustion turbine.

The LNG vaporizers would be vertical shell and tube heat exchangers, with LNG flowing on the tube side and heat transfer fluid (HTF) flowing on the shell side. The vaporizers would use a glycol-water solution as its HTF. Cold HTF leaving the shell side of the vaporizers would be pumped through the HTF heaters and returned to the vaporizers. The HTF heaters would be heated by hot water from natural gas-fired hot water heaters. The HTF heating system is sized to provide sufficient heat to vaporize the baseload natural gas sendout rate, with one spare pump and one spare heater. The natural gas fuel for the system would be produced either from vaporized LNG from the LNG terminal or from backfeed from the pipeline (for startup).

AES is considering building a combined cycle power plant at the terminal site. In that event, the LNG terminal would make use of a portion of the waste heat recovered from the exhaust of a gas turbine generator to vaporize the LNG. After passing steam from a waste heat recovery boiler through a condensing steam turbine generator, the hot condensate would be pumped through a bank of plate and frame heat exchangers, transferring roughly two-thirds of the heat needed to vaporize the 1.5 Bcfd design sendout into the cool HTF stream entering these heat exchangers. Upon exiting the plate and frame heat exchangers, the warmed HTF would be further heated in the HTF heaters as needed to vaporize the full sendout flow.

2.1.1.4 Vapor Handling System

During normal operation, ambient heat input into the LNG storage tanks would cause a small amount of LNG to vaporize; the vaporized gas is commonly known as boil-off gas (BOG). The LNG vapor handling system would be designed to handle the vapor generated in the storage tanks coincident with a peak unloading rate of 12,500 m^3/hour. During LNG ship unloading, heat input into the system would be from pumping and heat transfer from the ambient surroundings. To suppress some of the vapor that would be generated due to the additional heat input the storage tanks would be operated at a pressure above that of the LNG ship. This would allow part of the heat input of the system to manifest itself as a heat increase in the LNG.

Two vapor return blowers would be used to remove a portion of the vapor generated in the storage tanks during LNG ship unloading. The vapor from the discharge of the blowers would be returned to the LNG ship through a vapor return line and a vapor return arm. It is possible that BOG from the LNG tanks would need to be desuperheated. In this case, a small stream of LNG would be sprayed into the vapor stream line just upstream of the BOG Drum. This is the same process that would be used to cool the returning vapor as the returning vapor would be warmer than allowable for the LNG ship.

The remainder of the vapor generated in the storage tanks during LNG ship unloading would be handled by three BOG compressors. The vapor from the discharge of the compressors would be condensed in the BOG condenser. During periods in which no LNG ship is unloading, only one of the compressors would be required to operate.

The LNG terminal has been designed to minimize fugitive emissions (with no venting during normal operations) by provision of a closed vent/drain system. All LNG and natural gas relief valves, excluding LNG storage tank, LP fuel gas drum, IP fuel gas drum and the LNG vaporizer outlet process relief valves, would be vented into a closed vent system that is common with the LNG storage tank vapor spaces. In case of excess relief system pressure, the vent pressure control valve would dump gas to the discretionary vent stack. A continuous nitrogen gas sweep would be incorporated downstream of the vent pressure control valve to ensure proper purging of the discretionary vent stack.

The LNG terminal would not use flares.

2.1.1.5 Nitrogen Use

Nitrogen would be used within the LNG terminal during normal operations and for preparing equipment for maintenance or return to service after maintenance. Nitrogen would be used to prevent concentrations of natural gas vapors and oxygen reaching the lower flammability limit. The total nitrogen design consumption for the LNG terminal is 334 standard cubic feet per minute (scfm). The total continuous consumption is 29 scfm. This is based on nitrogen usage in the following equipment and/or processes:

- Unloading and Vapor Return Arms - for purging of the unloading and vapor return arms before, during and after unloading;
- Platform Drum - LNG liquid is drained from the unloading arms to this drum at the end of the ship unloading and the liquid is transferred to the LNG storage tanks via the unloading line using nitrogen pressure;
- LP Pumps – for maintaining a positive nitrogen seal and/or continuous purge in the junction boxes of the LP pumps;
- Vapor Return Blower and BOG Compressors - for purging of the seals on these components;
- HP Pumps and IP Pumps – for maintaining a positive nitrogen seal and/or provide a continuous purge to the electrical and instrumentation junction boxes;
- Vent Header and Discretionary Vent Stack - to continuously sweep the vent header and stack to prevent air entry; and
- HTF Expansion Tank - nitrogen is supplied to maintain back pressure in the HTF Expansion Tank during HTF system temperature swings.

The nitrogen system would consist of:

- a liquid nitrogen storage tank;
- a dedicated small ambient air vaporizer to maintain pressure in the tank;
- two vaporizers (1 operating, 1 back-up) for supply of gaseous nitrogen to meet the nitrogen demand; and
- a piping network distributed throughout the LNG terminal to provide nitrogen to equipment and utility services.

2.1.2 LNG Ships

2.1.2.1 LNG Shipping and Ship Design

The ships that transport LNG are specifically designed and constructed to carry LNG for long distances. LNG ship construction is highly regulated and consists of a combination of conventional ship design and equipment, with specialized materials and systems designed to safely contain liquids stored at temperatures of -260 °F.

LNG could be shipped from a variety of sources around the world, including such locations as Algeria, Australia, Brunei, Indonesia, Malaysia, Nigeria, Oman, Qatar, Trinidad and Tobago, and United Arab Emirates. The transit route for LNG ships from the entrance of the Chesapeake Bay to the terminal site would be about 164 nautical miles. From the sea, LNG marine traffic would enter the Chesapeake Bay at the southern entrance between Cape Henry and Fisherman's Island, and travel northward along the Cape Henry Channel and York Spit Channel, both of which are dredged and maintained to a depth of 50 feet, and then continue northwesterly up the dredged and maintained Rappahannock Shoal Channel past the mouths of the Tangier Sound and Pocomoke Sound to the north and the Rappahannock River to the west. Shortly after passing Smith Point, the LNG vessel would enter the state waters of Maryland. Once past Smith Point, the transit of a LNG vessel would remain on the eastern side of the Chesapeake Bay following the naturally deep water. The carrier would pass the mouths of the Potomac River and Patuxent River to the east and Smith Island and Hooper Islands to the west. The LNG vessel would then transit along the west side of Kent Island, turn slightly west, passing the mouth of the Severn River and then turn slightly north and pass under the Bay Bridge. North of the Bay Bridge, there are a series of dredged and maintained channels which lead into and through the POB. Tugs would meet the LNG vessel south of the Bay Bridge and escort the LNG vessel along the Brewerton Channel and into the Marine Channel. The Coast Guard states that during transit, one towing vessel of at least 70-ton bollard pull shall be present in the vicinity of the Bay Bridge, prior to the LNG vessel passing underneath the bridge, and that three towing vessels of at least 50-ton bollard pull shall escort the LNG vessel while it transits the approaches to the POB. LNG vessel routes, tug assistance, and escort boats are addressed in sections 4.12.5.4, 4.12.5.5, and 4.9.4.2.

The Marine Channel (also referred to as the Sparrows Point Shipyard Channel by the applicant) would be widened and deepened to accommodate the proposed LNG vessels that would call on the terminal. A detailed map presentation of the LNG ship transit route through Chesapeake Bay is found in figures 4.12-1 and 4.12-2 located in Appendix K.

Although LNG ships and their activities are part of the operation of the proposed Sparrows Point LNG import terminal, these ships are not subject to Section 3 authorization sought in this application. However, the Coast Guard is responsible for determining the suitability of the Chesapeake Bay and associated ship channels for these LNG ships and must issue an LOR regarding the suitability of the waterway. Therefore, the potential environmental impacts of shipping LNG along this waterway are addressed under each specific section of this EIS. A description of LNG marine traffic safety, including a detailed discussion of LNG transport, is provided in section 4.12.5.

The LNG ships would be selected and operated such that their maximum arrival draft would not exceed 40.5 feet. The berths, turning basin, and approach channel would be dredged so that the water depth is at least 45 feet at Mean Lower Low Water (MLLW) to provide adequate under keel clearance at all tide stages.

2.1.2.2 LNG Ship Ballasting and Ship Boiler Cooling Water Intake and Discharge

The LNG vessels would be loaded when they arrive at the LNG Terminal. Since loaded LNG ships typically do not carry a significant amount of ballast water, no ballast water is expected to be discharged at or near the LNG Terminal. However, as each vessel is unloaded, the LNG vessel would take on ballast seawater in order to maintain a constant draft at the berth. Among other factors, vessel displacement would determine the volume of ballast water needed. LNG vessels in the 217,500 m^3 range would carry up to approximately 21.1 million (MM) gallons (80,000 m^3) of ballast water (i.e., maximum ballast tank capacity). These carriers typically have two to three onboard pumps each with 660,000 gallon per hour (2,500 m^3 per hour) rated capacity. Typically, the intakes would be screened to prevent foreign objects or fish from being pumped into the ballast tanks.

When in port, LNG vessels would also withdraw and discharge engine boiler cooling water (non-contact exchange) from the Patapsco River. Representative volumes of these intakes and discharges, based on similar projects for a range of vessel sizes, would be about 18 million to 57 million gallons of engine cooling water per ship visit. These intakes and discharges are analyzed in sections 4.3.2.5 and 4.6.2.2.

2.1.3 Pipeline and Associated Facilities

2.1.3.1 Pipeline Facilities

The Sparrows Point LNG Terminal would be connected to three interstate natural gas pipeline systems via the proposed 87.6-mile long Mid-Atlantic Express Pipeline. The Pipeline would be able to deliver up to 1.5 Bcfd on a firm basis with a maximum allowable operating pressure (MAOP) of 2,080 psig.

The proposed pipeline route generally parallels existing rights-of-way for highways, overhead electric transmission lines and pipelines. Generally, the pipeline would:

- exit the former Sparrows Point Shipyard and steel mill property, north to northeast, for approximately 2 miles (MP 0.0 to 2.0);
- follow Interstate – 695 (I-695) with the exception of minor divergences north and northwest for approximately 6 miles (MP 2.0 to 8.0);
- near the Back Creek crossing, turn north northeast and follow a BGE overhead transmission corridor for approximately 24.5 miles (MP 8.0 to 32.5); and
- at an intersection with the right-of-way for an existing Columbia pipeline, turn northeast and generally parallel the existing pipeline corridor for approximately 54 miles (MP 32.5 to 87.6) to its terminus near Eagle, Pennsylvania.

2.1.3.2 Aboveground Facilities

Aboveground facilities associated with the proposed Mid-Atlantic Express Pipeline would include:

- a pig launcher facility, valves, and metering station at the beginning of the pipeline within the fenceline of the Sparrows Point LNG facility;
- ten mainline valves (MLVs), spaced to meet DOT requirements (see section 4.12.9); and
- three interconnect facilities which would have metering, flow control and/or pressure control functionality (as required), scraper receiver/launcher capability, system isolation, i.e., remotely controlled station isolation valves, Supervisory Control and Data Acquisition (SCADA), as well as security and safety equipment.

The location of the aboveground pipeline facilities are identified in table 2.1.3-1. These aboveground facilities are also shown on the pipeline route figures in Appendix B.

TABLE 2.1.3-1

Aboveground Pipeline Facilities

Facility Name	County/State	MP
Pig Launcher	Baltimore/MD	0.0
Mainline Valve MLV 1	Baltimore/MD	9.87
MLV 2	Baltimore/MD	19.78
MLV 3	Harford/MD	29.43
MLV 4	Harford/MD	39.35
MLV 5	Lancaster/PA	49.30
MLV 6	Chester/PA	59.23
MLV 7	Chester/PA	69.27
MLV 8	Chester/PA	78.11
Interconnect – Transco	Chester/PA	81.12
MLV 9	Chester/PA	82.91
MLV 10 **a/**	Chester/PA	84.65
Interconnect – TETCO	Chester/PA	87.34
Interconnect – Columbia	Chester/PA	87.57

a/ This MLV site was not identified in the DEIS.

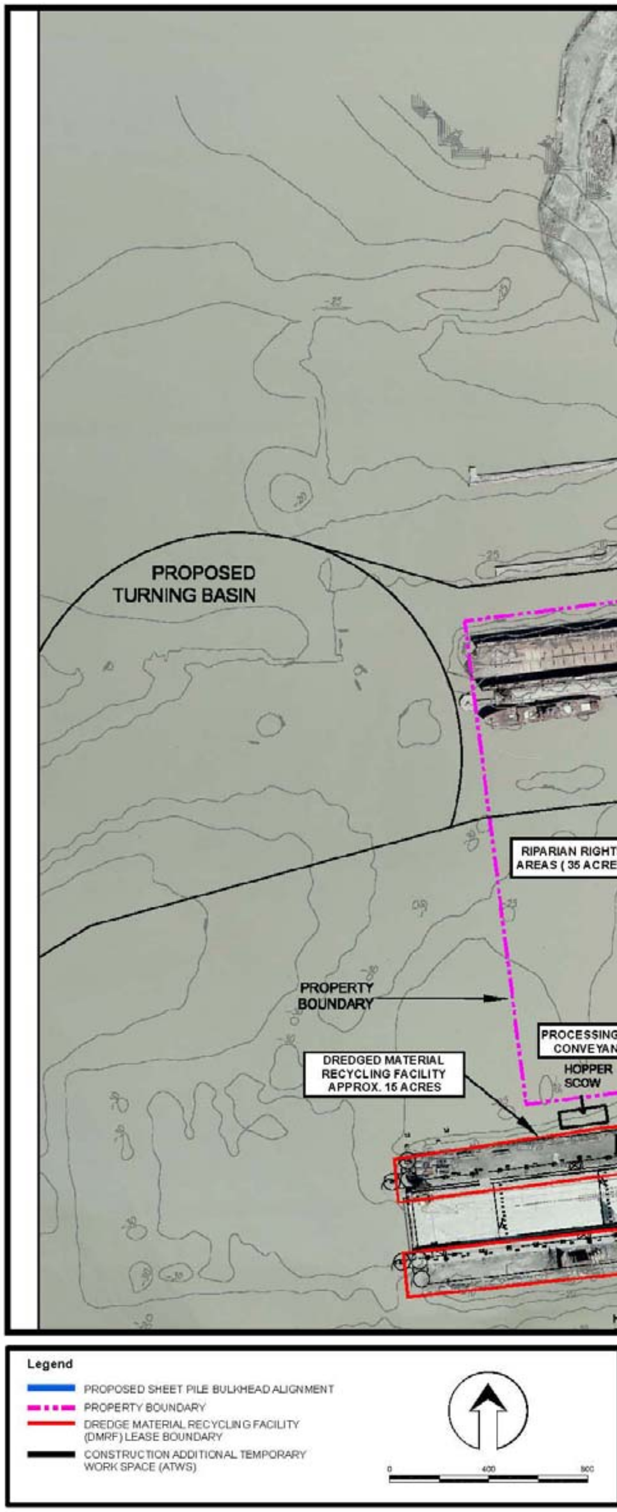


Figure 2.2.1-1
Sparrows Point LNG Terminal
Property and Associated Dredge and Temporary Work Space Areas

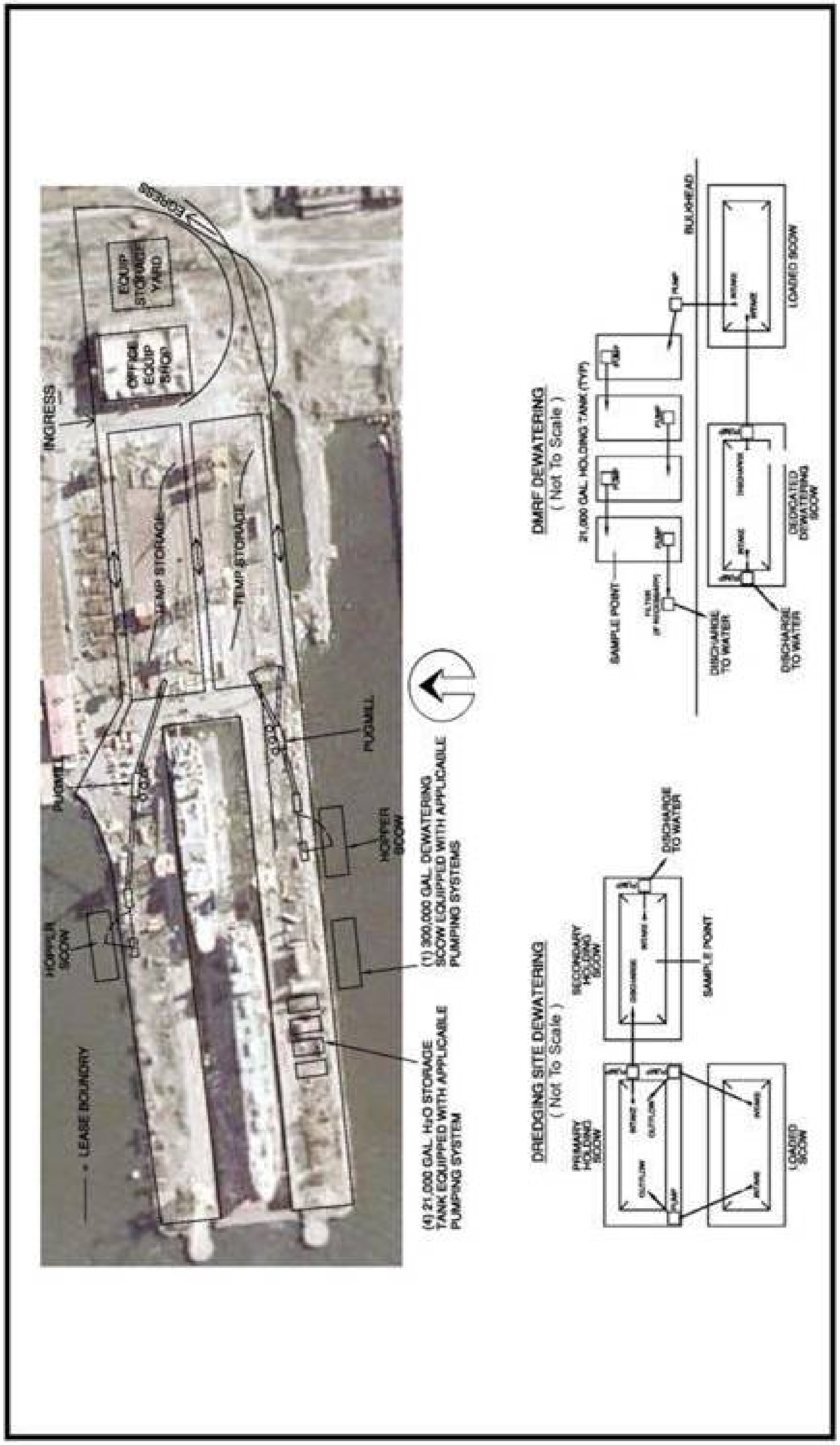


Figure 2.2.1-2
Sparrows Point LNG Project
Dredge Material Recycling Facility Plan

2.2 LAND REQUIREMENTS

2.2.1 LNG Terminal

For construction of the LNG facilities, approximately 198 acres of land and water would be affected. On land, approximately 45 acres of upland for the LNG terminal proper, and an additional 15 acres of upland located just south of the property boundary (for use as the Dredged Material Recycling Facility [DMRF] and temporary storage area) and 20 acres of upland to the north of the site (for use as a contractor yard), would be utilized as shown on figures 2.2.1-1 and 2.2.1-2. During construction, 118 acres of open water/bay bottom would be affected by dredging of the approach channel and the turning basin, and by construction of the dock facilities.

During operations of the LNG terminal facilities, land requirements would include the 45-acre upland plot at Sparrows Point, as well as 35 acres of near-shore riparian rights area, for placement of the offloading platform and two LNG ship berths. The potential power plant presently under consideration would also be situated within the 45-acre permanent parcel.

TABLE 2.2.2-1

Summary of Land Requirements Associated With Construction and Operation of the Pipeline and Aboveground Pipeline Facilities for the Mid-Atlantic Express Pipeline

Project Component	Impact Type	Land Affected During Construction (acres)	Land Affected During Operations (acres)
Pipeline Facilities			
Mid-Atlantic Express Pipeline	Temporary construction and permanent maintained workspace a/	1,027.9	542.0
	Additional temporary workspace areas	215.2	0
	Temporary access roads a/, b/	41.5	0
	Permanent access roads	1.4	1.4
	Pipeyards, contractor yards, offices/trailers b/	315	0
Pipeline & Temporary Use Subtotal		**1601.0**	**543.4**
Aboveground Facilities			
Pipeline Mainline Valves (ten locations)	Construction workspace and permanent operating area	0.9	0.5
Pipeline Interconnects (3 locations) – Transco, TETCO, Columbia	Construction workspace and permanent operating area	1.5	0.7
Aboveground Facilities Subtotal		**2.4**	**1.2**
TOTALS – All facilities		**1,603.4**	**544.6**

a/ Areas estimated assuming 50 foot permanent ROW, 75 foot construction ROW over approximately 54.6 miles, 100 foot ROW over an estimated 33 miles in agricultural lands, and nominal 20 foot width for access roads.

b/ For the location of these Project components see Appendix B, figures B-1 through B-32.

2.2.2 Pipeline and Associated Facilities

Construction of the pipeline and aboveground pipeline-related facilities would disturb 1,603.4 acres (summarized in Table 2.2.2-1). This would include 1,027.9 acres for the pipeline construction right-of-way, 215.2 acres for temporary extra workspace and staging areas, 315 acres for pipeyards and contractor yards, 41.5 acres for temporary access roads, and 1.4 acres for permanent access roads. It also includes 2.4 acres of land that would be impacted during construction of the ten mainline valves (0.9 acres) and for construction of the three interconnect facilities (1.5 acres).

Of the land disturbed by construction, approximately 542 acres would be utilized as permanent right-of-way for the pipeline, 1.4 acres would be retained as permanent new access roads, and approximately 1.2 acres would be retained for the aboveground facilities. The remaining 1,058.8 acres would revert to former uses (except in the case of forest habitat which would remain open space but would be converted to maintain herbaceous cover).

Approximately 74.3 miles (84.8 percent) of the pipeline would be constructed adjacent to or within rights-of-way for existing utilities (pipelines or power lines or communication cables) or roadways (see table 2.2.2-2). For a summary of how the pipeline would affect different land use types (by total project and by county) see section 4.8.1 and table 4.8.1-1.

2.2.2.1 Pipeline Right-of-Way and Additional Temporary Workspace

Mid-Atlantic Express proposes to use a 75-foot-wide right-of-way to construct approximately 54.6 miles (62 percent) of the pipeline, and would use a 100-foot-wide right-of-way to construct the remaining 33 miles (38 percent) of the pipeline through agricultural lands. Figures 2.2.2.1-1, 2.2.2.1-2 and 2.2.2.1-3 show typical construction right-of-way cross sections for the workspace in varying work conditions.

Additional temporary workspaces (ATWS) and staging areas would be required for construction at waterbody crossings, road and railroad crossings, foreign pipeline crossings, and for horizontal directional drill (HDD) workspace. The locations, sizes, and specific uses of these extra workspaces are specified in Appendix C, table C-1.

We have reviewed the ATWS identified in Appendix C and find them necessary for the safe construction of the proposed Project. If AES or Mid-Atlantic Express identify any route realignments or facility relocations; changed locations for staging areas, pipe storage yards, or access roads; or any other areas that would be used or disturbed and have not been previously identified in filings with the FERC, we are recommending that AES or Mid-Atlantic Express provide detailed alignment maps/sheets and aerial photographs of these changes. Each area would need to be approved in writing by the Director of OEP before construction in or near that area could commence, per recommendation number 5 in section 5.2.

2.2.2.2 Access Roads and Pipeyards

Mid-Atlantic Express proposes to temporarily use 70 roads for access to the right-of-way during pipeline construction. Fifty-seven of these access roads and portions of three others are existing paved, gravel, or dirt roads. In some instances, improvements would be necessary (e.g., widening, reinforcing, or adding gravel). Table C-3 in Appendix C lists the proposed access roads that would be used during construction of the Mid-Atlantic Express Pipeline (also see figures in Appendix B). Ten access roads and the aforementioned portions of three roads would be newly constructed for this Project; these would be in locations where Mid-Atlantic Express requires access to the proposed right-of-way but no existing access is available.

The additional temporary workspaces needed for pipe storage and contractor yards and field offices are also given in Appendix C, table C-2. The locations of these proposed pipeyards are shown in Appendix B. Mid-Atlantic Express proposes the use of 315 acres of property for pipeyards (see table 2.2.2-1).

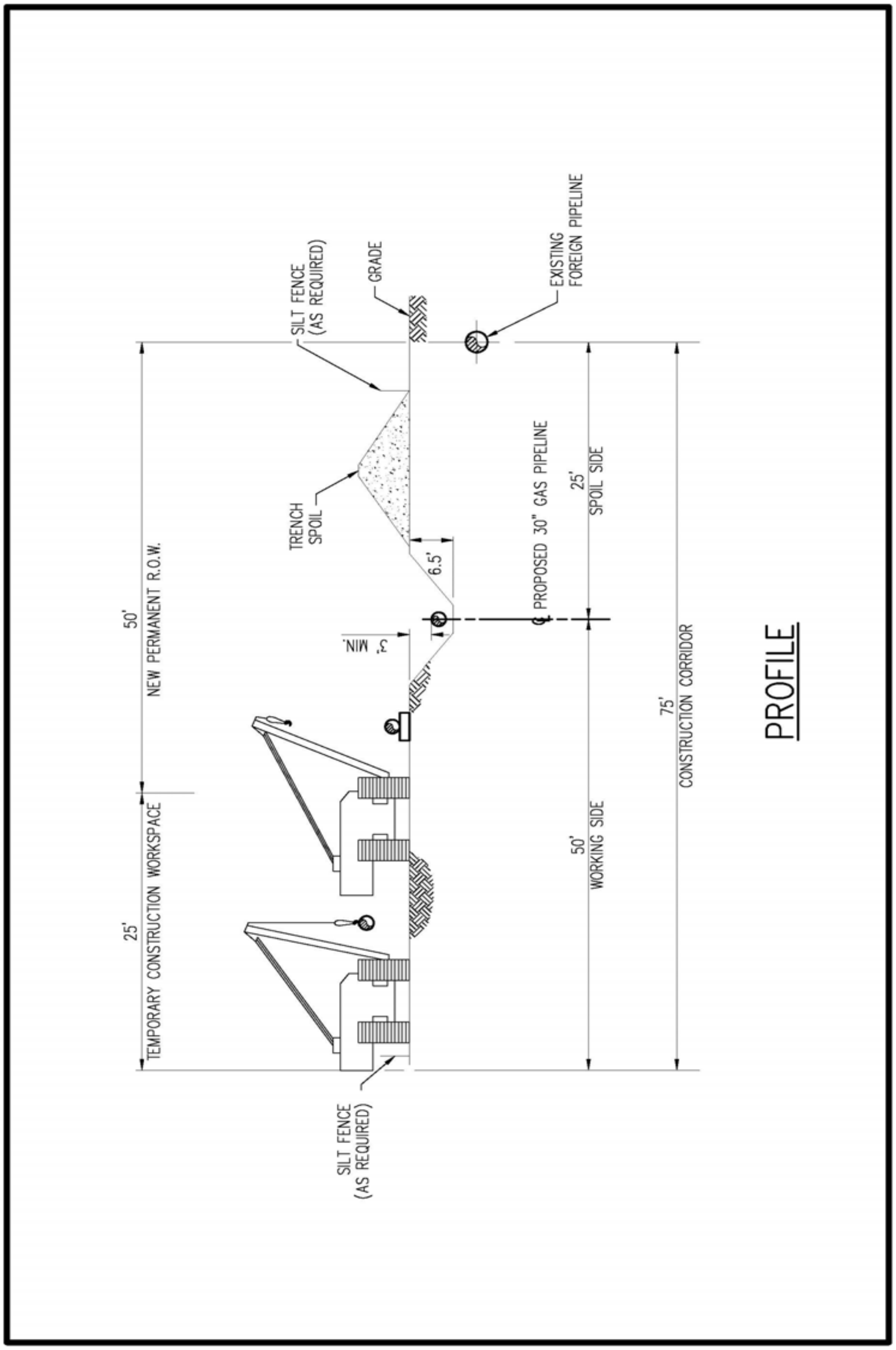
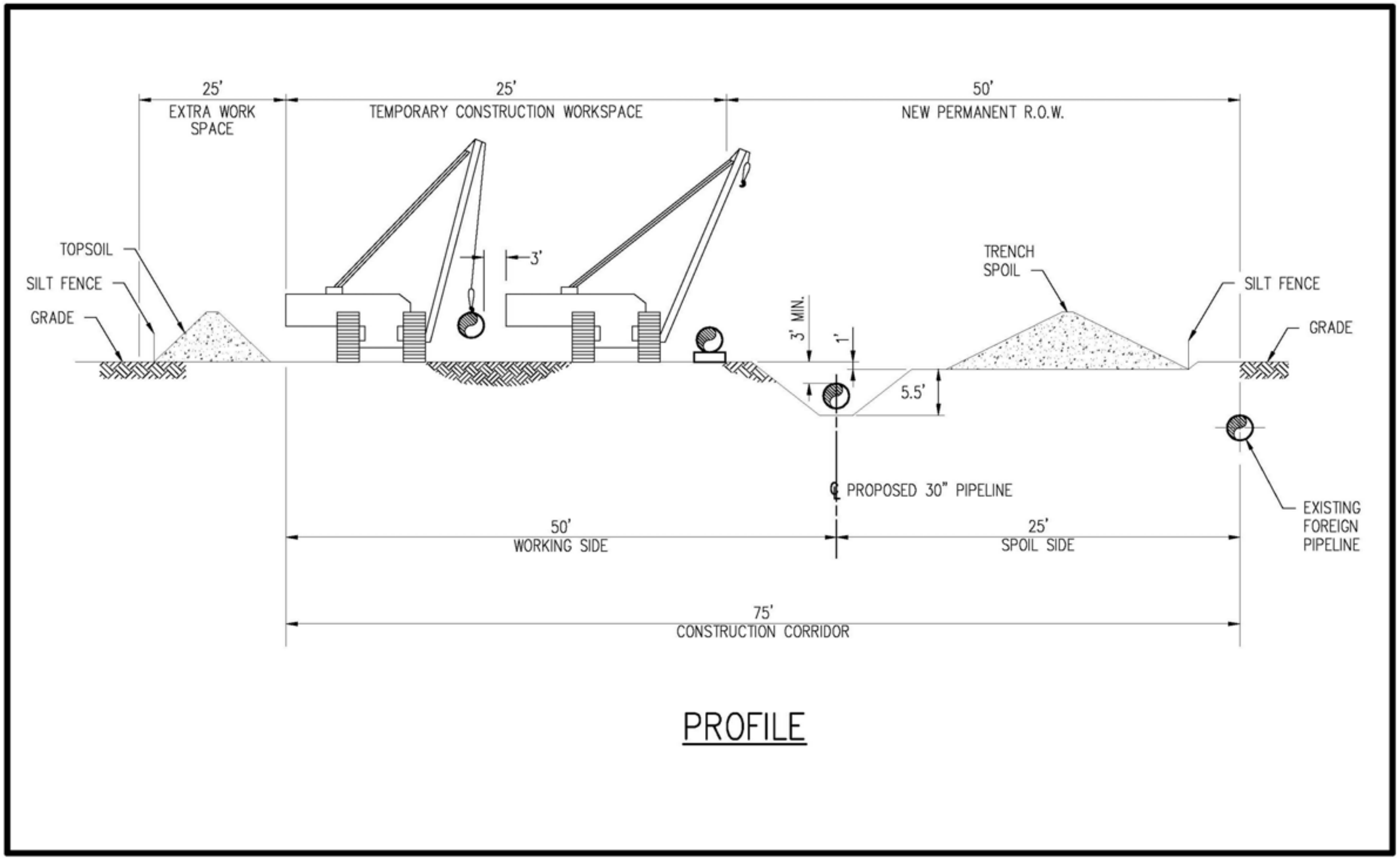


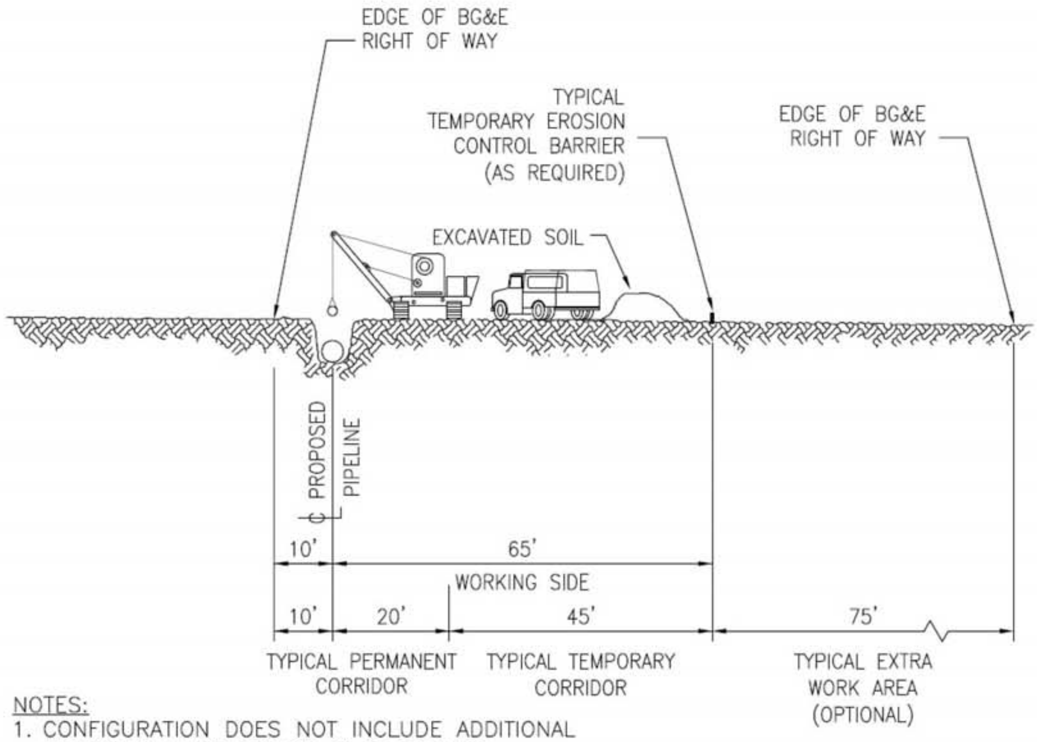
Figure 2.2.2.1-1
Mid-Atlantic Express Pipeline
Typical Right-of-way
Cross-Section
Adjacent To Foreign Pipeline

NOT TO SCALE



NOT TO SCALE

Figure 2.2.2.1-2
Mid-Atlantic Express Pipeline
Typical Right-of-way
Cross-Section With
Topsoil Segregation



NOTES:

1. CONFIGURATION DOES NOT INCLUDE ADDITIONAL TEMPORARY WORKSPACE AT CROSSINGS.
2. PROPOSED PIPELINE TO MAINTAIN A MINIMUM OF ONE FOOT CLEARANCE BETWEEN SUBSURFACE UTILITY CROSSING.
3. PIPELINE COVER SHALL BE MIN. 3FT IN NON-AGRICULTURAL AREAS OR MIN. 4FT IN AGRICULTURAL AREAS.
4. REDUCE WORK AREA AT STRUCTURE LOCATIONS.
5. RESTRICTED USE UNDER POWER LINES (AS REQUIRED)

NOT TO SCALE

Figure 2.2.2.1-3
Mid-Atlantic Express Pipeline
Typical Pipeline Construction Right-of-way Within BG&E Right-of-way

TABLE 2.2.2-2

Summary of Existing Rights-of-Way Co-located With or Paralleled by the Proposed Pipeline Route

Begin MP	End MP	County/State	Existing ROW a/	Width of Existing ROW (feet) b/	Width Used for Temporary Construction (feet) c/	Width Used for Permanent ROW (feet)
2.4	2.5	Baltimore, MD	I- 695	150-200	0-25	0
3.7	5.4	Baltimore, MD	I- 695	400-1400	75	50
5.6	6.0	Baltimore, MD	I-695	150-200	75	0-50
6.4	7.9	Baltimore, MD	I- 695	150-200	15-75	15-50
8.0	9.1	Baltimore, MD	BGE	50-100	50-75	25-50
9.1	9.4	Baltimore, MD	I-695	150-200	0-25	0
9.8	15.1	Baltimore, MD	BGE	50-100	75-100	25-50
15.5	15.9	Baltimore, MD	BGE	50-100	75-100	25-50
16.4	17.1	Baltimore, MD	BGE	50-100	75-100	25-50
17.2	25.7	Baltimore, MD	BGE	50-100	75-100	25-50
26.6	32.3	Harford, MD	BGE	50-100	75-100	25-50
32.3	33.7	Harford, MD	Columbia	30-50	15-25	15-25
34.0	38.0	Harford, MD	Columbia	30-50	15-25	15-25
38.4	40.0	Harford, MD	Columbia	30-50	15-25	15-25
40.2	47.9	Harford, MD	Columbia	30-50	15-25	15-25
48.3	51.1	Lancaster, PA	Columbia	30-50	15-25	15-25
52.0	53.5	Lancaster, PA	PECO	300	50-100	50
53.5	62.6	Lancaster and Chester, PA	Columbia	30-50	15-25	15-25
62.8	64.9	Chester, PA	Columbia	30-50	15-25	15-25
65.1	66.5	Chester, PA	Columbia	30-50	15-25	15-25
66.5	75.2	Chester, PA	Columbia	30-50	15-25	15-25
76.4	79.4	Chester, PA	Columbia	30-50	15-25	15-25
79.8	80.2	Chester, PA	Lloyd Ave	40	0	0
80.4	80.5	Chester, PA	Columbia	30-50	15-25	15-25
80.9	81.1	Chester, PA	Transco	50-100	15-25	15-25
81.1	82.2	Chester, PA	Columbia	30-50	15-25	15-25
82.4	82.5	Chester, PA	Columbia	30-50	15-25	15-25
82.7	85.2	Chester, PA	Columbia	30-50	15-25	15-25
85.4	85.6	Chester, PA	Park Road	40	0	0
85.9	86.4	Chester, PA	North Pottstown Pike	40	0	0
86.4	86.4	Chester, PA	Fellowship Road	40	0	0
87.2	87.4	Chester, PA	Columbia	30-50	15-25	15-25

a/ Columbia – Columbia Gas Transmission Corporation natural gas pipeline.
Transco – Williams Transco natural gas pipeline.
BGE – Baltimore Gas & Electric Company electric transmission line.
PECO – PECO Energy Company electrical transmission line.
I-695 – US Interstate 695.
b/ ROW widths vary; values shown are ranges typical for each ROW width.
c/ Assumes typical 75-foot-wide ROW in non-agricultural areas and 100-foot-wide ROW in agricultural areas.

2.2.2.3 Aboveground Facilities

Mid-Atlantic Express proposes to construct aboveground pipeline facilities that would require 2.4 acres for construction and 1.2 acres for operation. Each of the three interconnects — with Transco, TETCO, and Columbia — would require 0.5 acre for construction and 0.25 acre for operation. Each of the ten mainline valve facilities would require 0.1 acre for construction and 0.05 acre for operation (also see figures in Appendix B).

2.3 CONSTRUCTION PROCEDURES

The proposed LNG terminal and natural gas pipeline would be designed, constructed, operated and maintained in accordance with applicable governmental regulations, permits, and approvals. Construction methods would be those that are consistent with industry-recognized practices, company policies, and best management practices (BMPs).

The general construction procedures proposed by AES and Mid-Atlantic Express for the LNG terminal and the natural gas pipeline are addressed in this section.

AES would design, construct, and maintain the LNG facilities in accordance with the DOT Federal Safety Standards for Liquefied Natural Gas Facilities, as found at 49 CFR 193. The facilities would also comply with the NFPA Standards for the Production, Storage, and Handling of LNG (NFPA 59A). These standards include guidance for siting, design, construction, equipment and fire protection for new LNG facilities. The ship docking and unloading facility as well as any appurtenances located between the LNG ships and the last valve immediately before the LNG storage would comply with applicable sections of the Coast Guard regulations for Waterfront Facilities Handling LNG, as found at 33 CFR 127 and Executive Order 10173.

Mid-Atlantic Express would construct and maintain the pipeline facilities to comply with the provisions of the Natural Gas Pipeline Safety Act of 1968, as amended [49 CFR 193].

2.3.1 LNG Terminal

Construction of the Sparrows Point LNG terminal would include activities to build the marine berth and offloading facilities, the LNG process facilities, the LNG tanks, associated support buildings, and dredging of the approach channel, turning basin and ship berths.

2.3.1.1 Ship Docking and Unloading Facilities

The construction process for the LNG ship berths would include the rehabilitation of an existing pier (Pier 1 of the existing Sparrows Point Shipyard), installation of an elevated unloading platform, and the installation of an elevated pipeway and associated spillway. This existing pier currently has a dry-dock facility immediately north of the pier.

Pier rehabilitation would include the concrete encasement, and/or splicing of the existing piles, repairs to the concrete cap, and repairs/resurfacing of the existing concrete deck. The repairs to the piles and caps would be accomplished from construction barges. The construction barges would provide the ability to be repositioned as required within the working area around the pier.

Pre-cast concrete elements for the unloading platform, pipeway, and associated spillway would be set into place via crane, which would be located either on construction barges or the existing pier, pending space availability. The construction barges would be anchored into place with spud piles.

The cast-in-place concrete elements to support the deck rehabilitation, unloading platform, pipeway, and associated spillway would be constructed from construction barges or landside, as space allows.

Once the rehabilitation of the pier deck has been completed, the elevated steel structure would be built to support the unloading platform, pipeway and spillway. This construction would take place from the land side; however, the final setting of the unloading arms would take place from a construction work barge.

2.3.1.2 LNG Storage and Process Facilities

Site Preparation

Demolition of selected structures existing at the terminal site would be needed to prepare the site for construction. The shipyard formerly consisted of ten slips used for ship construction and/or repair. Slip Numbers. 1 through 5 have been already demolished (by the current owner), and the area they occupied is at a common grade. Portions of the remaining slips (Numbers. 6 through 10) are used for hauling out and dismantling barges. Behind these slips to the east, the site contains two large buildings, a metal sided structure (known as the panel building), and a masonry structure (the fabrication building).

For development of the LNG terminal, the remaining slip structures would be demolished and the associated area leveled to the site's common grade. The panel building would also be demolished. A new shoreward bulkhead line would be established to straighten out the waterfront. The approximate alignment of the new sheet pile bulkhead is shown in section 2.3.1.3 (figure 2.3.1.3-1). Existing finger piers and low-level relieving platforms that lie offshore of the new bulkhead alignment would be removed as required (see figure 2.1.1-2).

Prior to construction of facilities at the site, AES would grade the ground surface where the LNG storage tanks and other structures would be built. No additional fill would be required under the footprint of the tanks. AES anticipates using a geofoam to provide adequate positive site drainage away from the tank perimeter. An earthen floodwall surrounding the tanks would be constructed of fill. The area outside the floodwall would be equipped with stormwater drains, and the ground surface would be graded to ensure stormwater flow into these drains. The drains would flow into an oily water separator and then to the Patapsco River through a discharge outlet that would be permitted by Notice of Intent (NI) for coverage under the Maryland general stormwater requirements. An NI has been prepared and submitted by AES to the MDE.

Fill material, in addition to that needed for the floodwall, would be needed for placement behind the sheet pile bulkhead. Due to the nature of the existing rubble and debris on the current site, it would be unlikely that AES would be able to reuse the bulk of the onsite materials. AES anticipates that approximately 25,000 cubic yards (CY) of fill would be needed to construct the floodwall. For construction of the sheet pile bulkhead, on-site soil would be removed to accommodate installation of the foundations and tie rods. Compacted granular fill would be used to backfill the resulting excavation behind the bulkhead. AES anticipates that the majority of the on-site soils would not be used as backfill for the bulkheads. They estimate that approximately 85,000 CY of granular fill would be needed for this backfill.

However, AES has also proposed to use the processed dredge material (PDM) from its dredging as fill material onsite, if the physical characteristics of this material are suitable for the site needs. AES would utilize admixtures to chemically and physically stabilize the dredged sediment. Specific agents that are admixed (such as Portland cement, pozzolanic materials, etc.) would be tailored to match sediment makeup (grain size, moisture, etc.) and chemical quality so that the recycled material produced would exhibit physical properties required for the intended application (like flowable fill or sub-base aggregate-type material), and would not leach contaminants once it has been processed. AES would need to perform appropriate analyses of the PDM and receive MDE approval for use of the PDM material onsite for site preparation, fill, and grading. To the extent that this PDM does not meet the design criteria for the purposes of on-site fill, or the quantity of PDM is not sufficient as needed onsite, then AES would procure and transport other suitable material from other available sources.

Storage Tank Construction

The initial site work would concentrate on the site improvement and foundations for the storage tanks. The tanks would be supported on steel H-piles and topped with a pile cap.

After the tank pilings and pile cap base slab are complete, construction would begin on the steel-lined, pre-stressed reinforced concrete outer tank wall and the outer tank roof. After the steel outer tank roof has been raised into position, the roof would be covered with reinforced concrete. Insulation would be installed for the tank bottom, and then the nine percent nickel inner tank construction would begin. Once the inner tank has been completed, a perlite insulation system would be installed into the annular space between the inner and outer tank. A suspended deck with insulation would sit above the inner tank to retain the cold in the inner tank. Piping on the outside of the tank and the tank roof would be installed during inner tank construction. The inner tank would be hydrostatically tested after completion. Hydrostatic testing procedures are described below. The outer tank would be pneumatically tested per an approved procedure.

The bulk materials for construction, including piping, insulation, electrical and instrumentation, would be received on-site. Subassembly (spooling) of pipe would begin as the pipe and fittings are received. Mechanical, electrical and instrumentation work would be concurrent with or closely follow pipe erection. Following the completion of pipe testing, pipe painting (as needed) and insulation would be conducted concurrent with electrical and instrument installation.

As the process, mechanical, electrical, and instrumentation work is completed, pre-commissioning activities would begin. Instruments would be calibrated before loop checks of the electrical and instrumentation circuits are completed. When the pre-commissioning activities are completed, the tanks and systems piping would be cleaned, hydrostatically tested, dried, and then purged with nitrogen. When the Project is ready for the first shipment of LNG, the tank would be purged of nitrogen gas and then cooled down using either LNG or nitrogen. Use of LNG for cooldown would require a loaded LNG ship with onboard regasification equipment to be furnished for approximately five days for the cooldown and subsequent filling of the tank.

Equipment required for construction of the LNG tanks would include cranes ranging in size from 30-ton to 200-ton capacity, multiple portable welding units, scaffolding, equipment trailers, and nondestructive test equipment. It is estimated that a maximum labor force of approximately 325 on-site personnel would be required for each tank and LNG system construction.

The concrete outer tanks would not require a coating for corrosion protection. Other exterior surfaces of the tanks would be provided with corrosion protection by painting or galvanizing of all carbon steel structures. The LNG storage tank structural steel would be painted with the exception of the galvanized items. Anchor bolts for LNG tank foundations would be galvanized.

Buildings

The structures associated with the on-shore portion of the LNG terminal would include the existing fabrication building, which would be refurbished to house the control room, administrative functions, and utilities; the compressor building; various other structures (fire pump house, security building, etc.); and the potential future power plant. Refurbishment of the fabrication building would include repair/replacement of portions of the roof, removal of hazards, and repair of interior foundations. Other site buildings would require new construction, and would be constructed in accordance with code requirements commensurate with their function. Where permitted, buildings would be constructed on concrete slabs and be primarily composed of concrete block with a sloped concrete slab for the roof. Construction of buildings having block walls would begin as the foundation slabs are completed. Roof installation would begin as soon as the walls are completed. Interior walls, windows and doors, interior wiring, and utilities would be added to the buildings as the exterior is completed.

Utilities

The LNG Terminal would be supplied with power from the local utility using two redundant 110 kilovolt (kV) power feeds. Additionally there would be a one hundred percent standby power generator set at the site. This standby power would be sufficient to maintain LNG circulation and to provide for terminal lighting, all control systems, and operation of other necessary auxiliary and emergency systems. If the nonjurisditional power plant is built (option under consideration by AES), the primary source of power to the LNG Terminal would be supplied from the 300 MW power plant, and the backup power would be from the two 100 kV feeds from the local utility. If constructed, the power plant would be built within the boundaries of the terminal site, and would be built contemporaneously with the LNG Terminal facilities.

Foundations and Process Equipment

The techniques used to construct the foundations for the associated structures (other than the LNG tanks) would depend on the soil bearing capacity of the selected site. Options for the foundations include the use of pile supports or spread footings. Foundations would be constructed of reinforced concrete and designed according to standard engineering practices. Foundations for all process equipment and large machinery would be completed before the units arrive on-site.

After the machinery is set on its foundation, it would be leveled and shimmed before securing the anchor bolts, with grouting being installed when required by the equipment manufacturer. Final alignment of rotating equipment would be performed after the final attachment of the pipe. After final alignment, pre-commissioning would begin with lubricant filling and initial electrical energizing for motor “directional rotation” checks. The systems would then be placed in service to support the balance of plant start up activities.

Piping

Typically, pipe is pre-fabricated in segments (spools), which allows complicated pipe segments to be completed more easily and within weather-protected structures. AES anticipates that some pipe spools would be fabricated by a vendor off site, and that some pipe spools would be produced on site. Piping would be fabricated and installed according to American Society of Mechanical Engineers (ASME) B31.3 standards. Installation would conform to the final design plans and specifications. Welders would be qualified according to ASME Section IX. For LNG and other cryogenic and flammable pipe services, the use of flanges or other potential leak sources would be minimized in the design.

Shortly after any process equipment is set and secured to its foundation, pipe attachment would begin. If the pipe is pre-fabricated, the final closure welds would not be completed until the equipment is set, to prevent pipe connection misalignment.

Long lengths of pipe that are installed on a pipe rack and/or structural supports could be installed in position. The pipe would be laid on the pipe rack, after which temporary support rolls would be installed so that the pipe lengths could be rolled during jointing or welding. When the jointing work on the long pipe rack lengths is completed, the temporary support rolls would be removed. Hydrostatic or pneumatic testing of the pipe would be conducted as soon as valves and/or flanges are attached. All the cryogenic piping would be pneumatically tested.

The pipe and mechanical installation work would be expected to be performed at many locations within the LNG terminal at the same time. Scheduling of the pipe work within any specific area would be determined by the deliveries of the major process equipment. Pipe and plumbing work inside the buildings would be included as part of the building construction or would be scheduled for installation concurrent with the building interior work.

2.3.1.3 Dredging and Dredged Material Disposal

Dredging

Construction of the LNG terminal would include widening and deepening the existing approach channel (only up to the existing Brewerton Channel) and the turning basin offshore of the terminal site to accommodate the LNG ships expected at the LNG terminal. LNG ships would be larger than the ships that have historically utilized the existing shipyard, floating dry dock and graving yard/coal channel (south of the proposed terminal site) (see figure 2.3.1.3-1). About 3.7 million CY of dredged material from an approximate 118 acre area in the Patapsco River, would be generated in order to meet the channel and turning basin design depth of –45 feet MLLW.

Dredging associated with the LNG terminal would begin in the berthing area, and progress in reaches towards the outer channel to allow for earlier commencement of pier/dock construction operations. The anticipated limits of the area to be dredged are shown in figure 2.3.1.3-1.

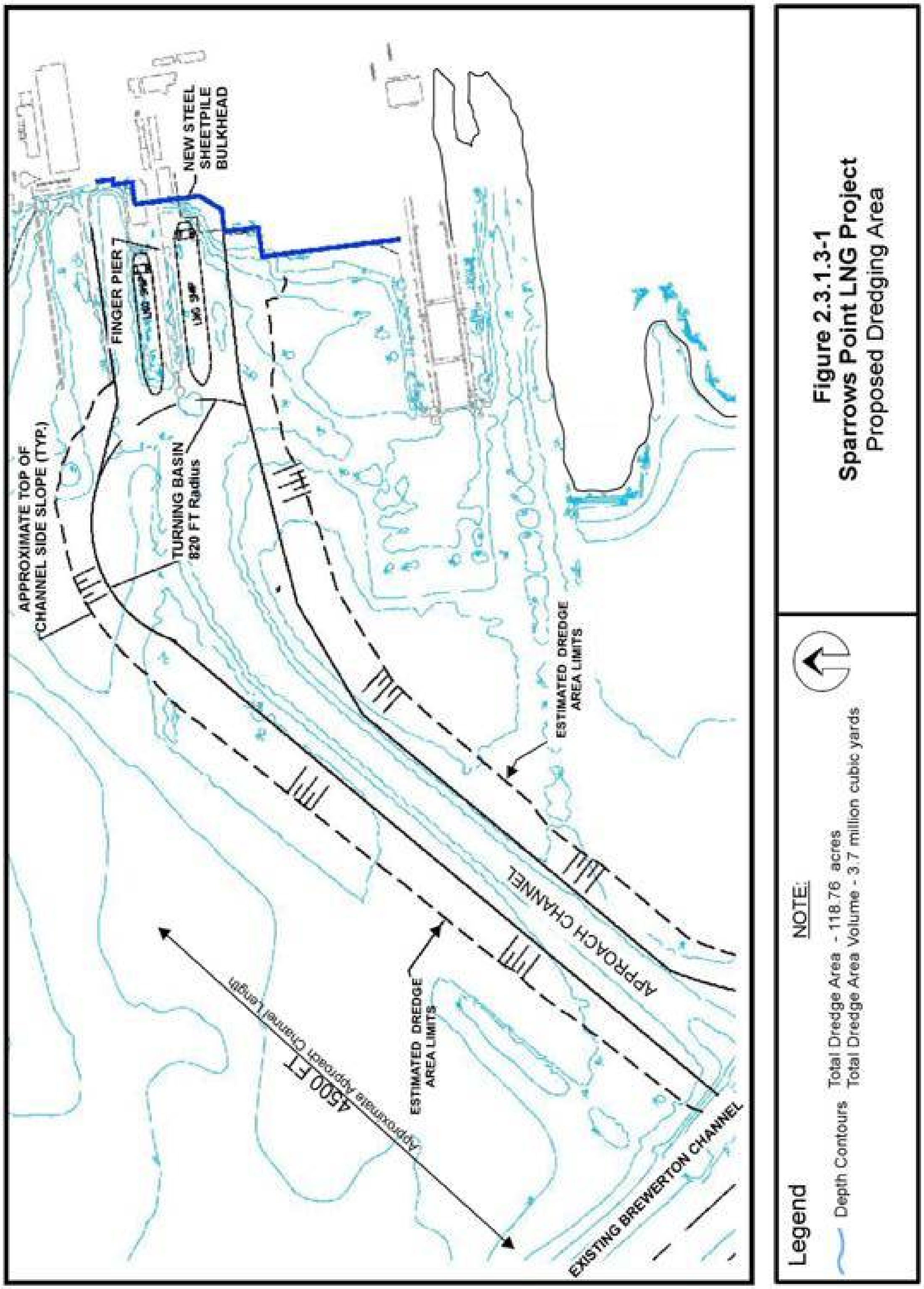


Figure 2.3.1.3-1
Sparrows Point LNG Project
Proposed Dredging Area

A directional Global Positioning System (GPS) would be used to locate the channel limits and to identify shoaled areas. Computer-controlled recording software would track the progress of the dredging and would ensure systematic coverage of the area to be dredged. Data collected for the Project regarding the existing sediment characterizations in the proposed dredge area have been evaluated as reported in section 4.3.2.4.

The Brewerton Channel, the existing approach channel, and certain areas offshore of the proposed terminal site have been dredged in the past and currently are the subject of dredging permits issued by the COE and a Water Quality Certification from the State of Maryland enabling the performance of dredging using hydraulic or mechanical techniques. Dredging of the approach channel and areas offshore of the proposed terminal site is allowed under these existing permits for maintenance and waterfront operations, to a depth of -39 feet MLLW. In addition, on May 6, 2005, the COE issued a permit to Barletta-Willis Inc., (BWI) Sparrows Point, LLC (CENAB-OP-RMN 04-64865-1), owners of the Sparrows Point Shipyard facility, approving mechanical or hydraulic dredging of a channel, turning basin, and berthing areas to -39 feet MLLW, and to place approximately 600,000 CY of dredge material at the Hart-Miller Island disposal site. Phase one of the BWI permit was accomplished in December of 2006. The permit also approved a subsequent phase that has not yet been accomplished. The second phase consists of the dredging and disposal of an additional 2.6 million CY of dredge material and is contingent upon the applicant's identification of an appropriate dredge material disposal site or method, and approval of the dredge material disposal site/method by the COE. Finally, the permit approved certain construction of sheet piling and fendering systems.

Some of the same dredge areas that would be required for the LNG terminal were authorized for additional dredging under the BWI Permit (though not to the same depth or entirely in the same area required by the proposed Project). The description of the proposed marine dredging has been developed to anticipate dredge operations consistent with this location's currently existing conditions; i.e., they assume that none of the phase two dredging contemplated in the BWI Permit is undertaken.

The proposed dredge operations and removal of 3.7 million CY of dredge material are based on consideration of the bathymetry of the approach channel, turning basin and berth areas as measured after the removal of the 600,000 CY of material by BWI in December, 2006. If BWI were to perform its authorized phase two dredging prior to initiation of the AES dredging, it could further reduce the volume of dredged material that AES needs to remove in order to achieve the design depths, channel width, and turning basin dimensions required for the LNG vessel operations.

AES intends to follow procedures for dredge performance consistent with recent past dredge approvals for this location, including the dredging by BWI. AES indicated that dredging would be conducted utilizing a mechanical (clamshell) dredge. A description and analysis of sediment quality and contamination is in section 4.3.2.4. Alternative dredging options and associated impacts of each method is in section 3.2.7. The impact of the proposed dredging by mechanical means is in section 4.3.2.5.

AES modified its proposed dredging method since the DEIS was issued. This change is reflected in its Consolidated Dredge Plan and revised Aquatic Resources Mitigation Plan. It now proposes using an environmental bucket to dredge all soft sediments to reduce sediment dispersion. It would be used to remove about 810,000 CY of material, or 22% of the dredging total, including the top contaminated layer. Additional information about the advantages of using this dredging method for removal of contaminants sediments and the improvements for water quality are addressed in sections 4.3.2.4 and 4.3.2.5.

Dredged Material Handling/Disposal at the DMRF

AES proposes to use a DMRF in order to process the dredged material and to recycle the material in beneficial ways. The equipment and processes used in the DMRF are addressed in this section (also see figure 2.2.1-2).

Dredging production would be sized to handle 10,000 CY per day, and operations would be expected to last approximately 24 months, with a dredging season of approximately 243 working days in a dredging year. AES anticipates using ten to fourteen 1,500 to 3,500-cubic yard work scows to transport the initial dredged material to the processing facility. All scows and containers would be of solid hull construction, and would be completely sealed and watertight in order to avoid any release of dredged material back into the water column.

The initial step in processing dredged materials at the DMRF would be the reduction of the water content. The process would involve dewatering of sediments in loaded barges (scows) at the dredging site or the DMRF. Dredged material in the loaded scows would be allowed to settle so that the free-liquid portion would be visibly free of suspended sediments prior to pumping the decant water to the cargo area of a dedicated dewatering barge. After solids settle, the decant water would be discharged within the area of dredging after testing for suspended solids or as required by permits. Alternatively, after the initial barge settling period, portable pumps could pump the water to land based tanks (i.e., frac tanks) for additional settling. All decant water from dewatered dredged material at the DMRF would pass through a settling tank system and be filtered prior to discharge back to the harbor. Chemical and physical analysis would be conducted on the decant water in accordance with a MDE Water Management Program Individual Permit for Industrial Water Discharge, a permit that would be necessary to operate the DMRF.

After raking, the raw dredged material would be stevedored from the work barges directly into a pugmill processing system utilizing hydraulic excavators equipped with hydraulic closed clamshell buckets. Then the screened, raw dredged material would be fed to a twin-shaft pugmill blending system and mixed with reagent admixtures formulated to avoid acidic conditions that would lead to leaching of possible contaminants. After mixing, the processed dredged material PDM would exit from the pugmill onto a radial stacking conveyor. The radial stacker could be positioned to load directly into trucks, or to stockpile the material for re-handling to trucks, railcars, or back to hopper scows (see figure 2.2.1-2).

Following processing, the PDM would be transported via on-site trucks to the designated staging area within the permitted temporary storage site. The PDM would be handled using hydraulic excavators, bulldozers, and vibratory compactors into large stockpiles for temporary storage until the material could be utilized for beneficial use.

The PDM would be trans-loaded by wheel loaders or hydraulic excavators into road trucks for off-site shipment to ultimate destination sites. While dredging production and dredged material processing would proceed at a rate of 10,000 CY per day, transportation of PDM offsite would progress at a rate of 5,000 CY per day. Thus, the schedule to remove the PDM from temporary storage would extend beyond the schedule for dredging and processing. The current AES schedule shows that the PDM stock pile would be removed from the site within 31 months, or about 11 months after the dredging activities cease. AES anticipates requiring about 220 truck trips per day to haul PDM off-site, which would equate to about 5,500 tons of PDM shipped off-site daily. Alternatively, the PDM could be transported by rail car (capacity per rail car is approximately 98 to 108 tons), or by a combination of truck and rail car to the final off-site destination.

Potential uses for the PDM could include:

- abandoned mine land and quarry reclamation;
- brownfields redevelopment;
- landfill capping and closure;
- alternate grading materials;
- low permeability cap layer in lieu of geo-membrane systems;
- manufactured top soil;
- general structural and non-structural fill for commercial / industrial development; and
- bulk construction fill, including site grading material and highway embankments.

The PDM would be tested for chemical and physical parameters to determine the structural suitability of the PDM for each of the above reuses or placement areas. AES has presented a matrix of the testing protocols and the criteria that would be used to determine which end use of the PDM is appropriate. This matrix can be found in Attachment 9 of AES's May 30, 2007 response to MDE questions about the dredging disposal testing methods (Accession No. 20070613-0083). The testing matrix also was included in AES's draft Consolidated Dredge Plan (see Appendix D). This testing matrix shows that for materials that would be destined for landfill closures, quarry and/or mining reclamation, general fill material, Portland cement feedstock, concrete batch plant feedstock, or golf course contouring, the PDM would be tested for the following chemical constituents:

- volatile organic compounds (VOCs) (EPA Method SW846-8260B);
- semivolatile organic compounds (SVOCs) (EPA Method SW846-8270C);
- pesticides/polychlorinated biphenyls (PCBs) (EPA Method AW846-8080A/8082);
- Target Analyte List (TAL) metals (EPA Method SW846-6010B/7471A); and
- total petroleum hydrocarbons (TPH) (EPA Method SW846-8015M).

These test results would be forwarded to the state agency in charge of reviewing the material quality for the various individual end-uses (e.g., in Maryland for many of these, the reviewing agency would be MDE).

In addition, the testing matrix shows that if AES were to send the PDM to sites for landfill closure (under the impermeable cap), the PDM would be tested for the following chemical parameters:

- Toxicity Characteristic Leaching Procedure (TCLP) metals (leachate test) (EPA Method SW1311/6010/7000);
- TCLP volatiles (leachate test) (EPA Method SW1311/8260);
- TCLP semivolatiles (leachate test) (EPA Method SW1311/8270);
- TCLP pesticides (leachate test) (EPA Method SW1311/8081);
- TCLP herbicides (leachate test) EPA Method SW1311/8150);
- ignitability (EPA Method SW846-1030);
- corrosivity (EPA Method SW846-9040;
- benzene, toluene, ethylbenzene, and xylenes (BTEX) (EPA Method SW846-8260B); and
- reactivity (EPA Method SW846-7.3.3.2/7.3.4.2.

Before sending the PDM to a non-hazardous treatment or disposal facility, the PDM would be tested for the following:

- pesticides/PCBs;
- TPH;
- TCLP metals;
- ignitability;
- corrosivity; and
- BTEX.

Likewise, the results of these tests would be sent to the agencies in Maryland or other states, as appropriate, to approve the PDM as acceptable for use in that state.

While AES has not identified the specific applications for the reused dredged material, the uses listed above have been demonstrated as technically and commercially viable in other port/harbor settings. Projects where contaminated material has been placed in upland disposal or beneficial use areas have included: abandoned mine reclamation in Clearfield County, Pennsylvania; landfill grading and capping in Brooklyn, New York; brownfields redevelopment projects in Jersey City and Woodbridge Township, New Jersey; and landfill closure projects in Linden, New Jersey, Brooklyn, New York, and Westwood, New Jersey. However, none of the projects cited exceeded 600,000 CY. Thus, the scale of the AES dredged material recycling process would be larger than past examples. Final determination of the applications would be made prior to initiation of the dredging activities and would depend on market needs and conditions at the time. Because the Sparrows Point Project is a private venture, all costs associated with the dredging and delivery of the recycled products would be borne by AES.

Although AES does not know the final placement of dredged material, it intends to pursue the beneficial uses indicated above. In the event these options are not viable, AES has given example waste placement areas managed by Waste Management and Allied Waste Services. These waste placement areas would be in Virginia. Therefore, for the portions of this study needing analysis of dredged material placement impacts, we have assumed truck transport of dredged material offsite as a conservative estimate of impacts.

Further details and specifications regarding dredging, equipment, schedule, spoils handling, and processing are provided in the AES's Consolidated Dredge Plan (see Appendix D).

2.3.2 Pipeline Facilities

2.3.2.1 General Construction Techniques

The typical pipeline construction sequence for installing a pipeline is given in figure 2.3.2-1. Mid-Atlantic Express would use primarily standard cross-country construction techniques, except in residential and agricultural areas, or in wetlands or stream crossings, which would require specialized techniques. Mid-Atlantic Express would construct the pipeline in accordance with its Environmental Construction Plan (ECP)**,** which is consistent with our Plan and Procedures except as noted in the ECP (Appendix T).

Surveys and Marking Right-of-Way

Surveys would be performed to prepare access to the construction right-of-way, identify the pipeline centerline, exterior construction right-of-way limits, and areas where temporary extra workspace is needed. Once surveyed, boundaries of the construction right-of-way would be marked (e.g., flagged, staked), indicating the limits of approved construction disturbance. In addition to centerline and limit surveys, other resources would be identified along the route. These would include other utility crossings (e.g., pipelines, power lines, railroads, and other wires/cables), special agricultural land features (e.g. drain tiles), the limits of waterbodies and wetlands to be crossed, and access roads.

While preparing the construction workspace, the contractor would install appropriate access from the public right-of-way roadway in accordance with the FERC-approved standard BMP. The vehicles would be limited to an access area defined within the confines of the final FERC-approved construction alignment. The hours of operation would be limited to daylight constraints, with the exception of certain activities such as HDD which would operate 24-hours per day.

Clearing and Grading

Following surveying, the pipeline construction right-of-way would be cleared of vegetation by personnel who have received training regarding the environmental conditions of the Certificate. A combination of heavy equipment and sawyers would be used to remove large trees, heavy brush, and small trees, but ground cover (i.e., including bushes) may remain until grading is required. Methods used for removing trees would take into account the proximity to structures and utilities. Mid-Atlantic Express should compensate landowners for timber loss. Marketable timber cleared from the right-of-way would be managed in accordance with the landowners' agreements, and other timber may be given back to the landowner (e.g., for firewood), used as timber matting in wetland crossings (if allowed by wetland permitting agencies), or properly disposed of as construction debris (e.g., burned, chipped or hauled to an approved disposal site). Mid-Atlantic Express would dispose of cleared vegetation and construction debris in accordance with local ordinances at approved disposal facilities. Construction debris would not be disposed of in the pipeline trench, in waterways, or within wetlands boundaries.

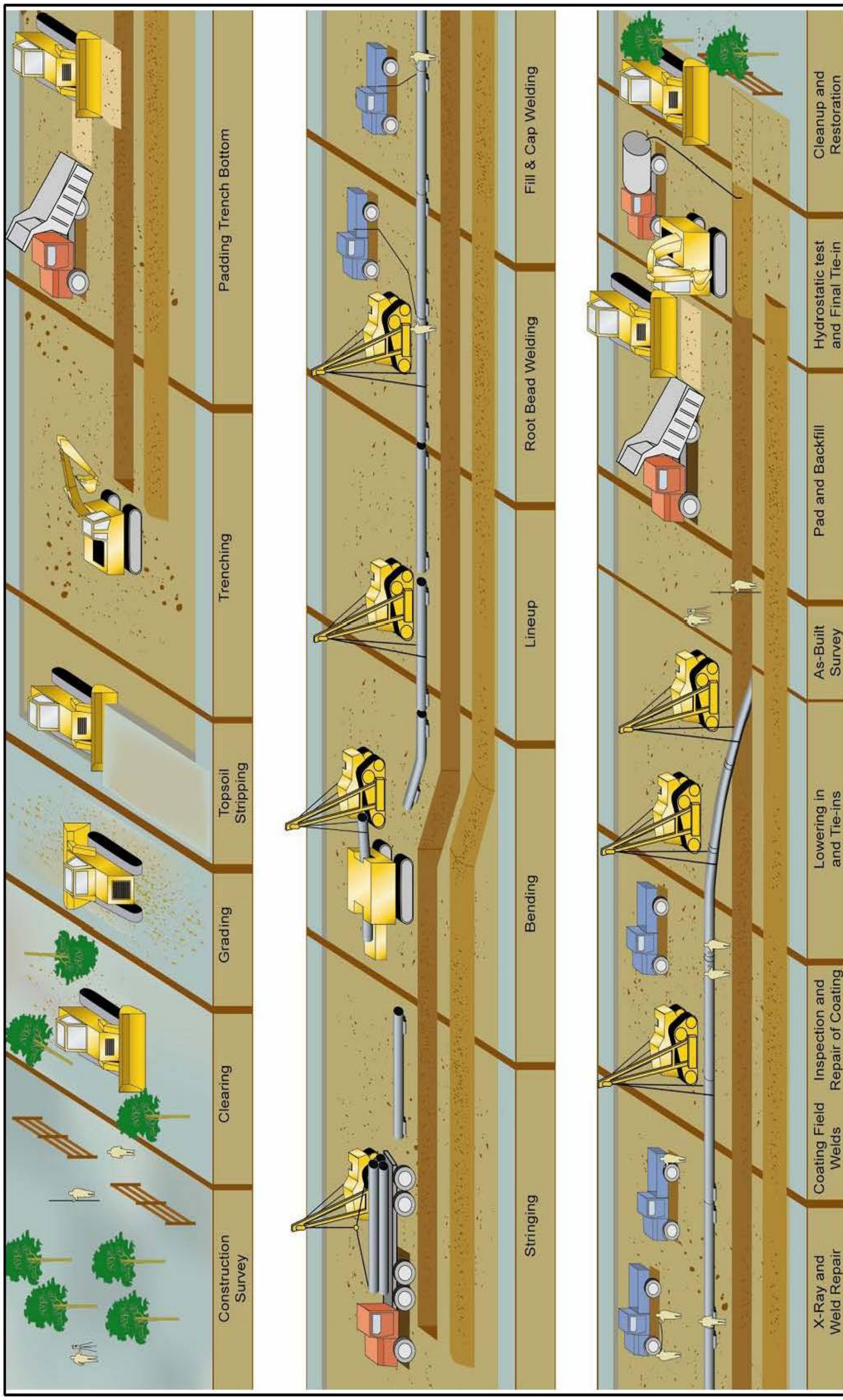


Figure 2.3.2-1

Mid-Atlantic Express Pipeline Project
Typical Pipeline Construction Sequence

Excavated soils normally would be stockpiled along the construction right-of-way to minimize the need for and potential impact of additional haul vehicles. In accordance with Mid-Atlantic Express's ECP, in agricultural lands and residential areas, topsoil (i.e. the upper-most fertile soil layer which is conducive to successful revegetation) up to a depth of 12 inches would be stripped from the trench and spoil storage area and segregated from subsoil at the edge of the right-of-way. The process of topsoil segregation would allow the topsoil to be replaced last during the backfilling of the trench and would avoid mixing of topsoil and subsoil. Alternatively, in residential areas, if there is inadequate space to segregate topsoil, Mid-Atlantic Express would import topsoil to complete restoration following construction.

To manage stormwater surface flow, regular breaks (gaps) in windrowed spoil piles and diversion structures would be used to manage drainage needs. Gaps would be located at regular intervals and/or where appropriate due to site conditions (e.g., depressions in terrain where water would be likely to pond).

Trenching

Backhoes or mechanical trenching machines would be used to excavate the pipeline trench. Under typical conditions, the average trench depth would be no less than 66 inches, to accommodate the 30-inch-diameter pipeline and 36 inches of cover. In agricultural areas and at certain crossings (e.g., roads, waterbodies), the trench depth would be greater in order to achieve the greater depth of cover requirements. The trench width would vary based on site conditions (e.g., soil types, bedrock, and presence of groundwater). In areas where shallow bedrock and/or large boulders are present, specialized construction techniques to remove the rock may be necessary (e.g., blasting, rock hammer). Blasting is addressed in the Specialized Construction Techniques section below.

Soil excavated during trenching operations would be temporarily stockpiled to the side of the trench. In areas where topsoil stripping would be required, the topsoil and subsoil would be segregated into separate piles on the right-of-way. Mixing of topsoil and subsoil would be minimized.

Where stormwater runoff flows are a concern, provisions would be made to prevent the trench from filling with water. Flume pipe or diversion berms/ditches may be used where needed to direct stormwater across the trench and away from the construction right-of-way. Inlet and outlet structures may also be necessary to prevent erosion and scouring. Additionally, on sloping terrain, trench plugs may be used to prevent water from scouring the bottom of the trench line.

Where trench dewatering is necessary, the trench water would be directed to vegetated areas off the construction right-of-way. Where adjacent vegetated areas are absent, or to protect a nearby waterbody or wetland, trench water would be filtered through a hay bale filter or other suitable filtering material before being discharged.

Stringing and Bending Pipe

Sections of line pipe (joints) would be strung along the right-of-way adjacent to the trench, set on wooden supports (skids), and arranged in a manner to be safely accessible to construction personnel. Joints would vary in length and may be individual (i.e., a single length of pipe) or double-jointed (i.e., two lengths of pipe pre-welded offsite). Pipe joint lengths from the mill may vary from 40 to 80 feet and could be cut as needed in the field. Depending on right-of-way requirements and restrictions, some pipe bends may be pre-manufactured at the pipe mill (factory bends). For all other bends (field bends), a mechanical pipe-bending machine would bend joints to the desired angle to accommodate pipeline alignment or natural ground contours.

Welding, Coating and Inspection

After the stringing and bending are complete, pipe sections would be aligned and welded together. All welding would be performed in accordance with the Project's Welding Procedure Specification by qualified welders who have passed specified qualifying tests. Welders and welding procedures would be qualified according to applicable American National Standards Institute (ANSI), ASME, and American Petroleum Institute (API) standards.

All welds would be inspected (100 percent), both visually and by nondestructive examination (NDE). Visual inspection would be performed on all welds to check for imperfections that could be seen with the naked eye. Weld imperfections would be rejected and repaired upon identification (i.e. before NDE). Welds would then be inspected using the NDE process (i.e., x-ray examination) for imperfections that were not visible with the naked eye. The NDE acceptance criteria would be in accordance with API 1104.

Line pipe would be coated to protect it from the environment and accelerated degradation. Line pipe normally would be mill-coated or yard-coated with a fusion-bonded epoxy, or similar material, prior to stringing. However, line pipe also would require a coating at the field welded joints where bare metal has been exposed. Prior to lowering the pipeline segment into the trench, the pipeline coating would be visually and electronically inspected to locate and repair coating faults or voids.

Lowering and Backfilling

The welded pipe section to be lowered-in would typically be placed into the trench with pipe slings and side-boom tractors. Once the pipe is lowered, trench plugs would be installed on sloping terrain and/or at sensitive environmental crossings, to prevent the subsurface conveyance of water which could create void space and subsidence. Clean fill (e.g., soil, sand) would be used where needed as padding material to provide protection to the pipe and coating. In no circumstances would topsoil be used as padding or backfill material. No foreign materials (e.g., construction debris, brush, trees or refuse) would be permitted to be used as backfill material. The trench would be rough backfilled using backfilling equipment (e.g., bulldozers, track hoes) to protect the pipe until final restoration can be completed. If allowed by permit conditions and landowner agreements, excess rock and woody debris (e.g., stumps, brush) may be buried on site within the right-of-way, or windrowed along the edge of the right-of-way. Otherwise, these materials would be properly disposed of off-site as construction debris.

Hydrostatic Testing

Prior to commissioning, the pipeline would be pressure-tested in accordance with engineering specifications and regulatory requirements. The test would be performed with an inert gas or liquid, with water being the standard. Proposed sources of test water for the pipeline would include primarily the Susquehanna River. The pipeline would then be tested in sections to at least 150 percent of the MAOP for a specified period of time (typically a minimum of eight hours), in accordance with DOT specifications. Test sections would be determined by pipe wall thickness and elevation changes. To the extent possible, once the test of a section is successfully completed, water would be reused in the adjacent test segment. AES and Mid-Atlantic Express have prepared a draft Pipeline Hydrotesting and Pre-Commissioning Plan (PHPCP) which can be found in the AES Sparrows Point application, Resource Report 2 – Water Resources, Appendix 2F – Pipeline Hydro Test Plan (Docket Number CP07-62-000, Accession # 20070109-4012) that would be used to test the Mid-Atlantic Express Pipeline. The methods proposed in the plan are based upon and would be performed in a manner that is consistent with Maryland General Permit for Discharge of Hydrostatic Test Waters (COMAR 26.08.04.09.K) and Pennsylvania General Permit for Discharges from Hydrostatic Testing of Tanks and Pipelines (NPDES General Permit PAG-10).

Prior to commencing hydrostatic testing, AES and/or Mid-Atlantic Express would obtain a Water Appropriation and Use Permit from the MDE Water Management Administration (WMA) in accordance with COMAR 26.17.06. Additionally, Mid-Atlantic Express would coordinate surface water withdrawal with the SRBC. Following testing, the hydrostatic test water would not be discharged directly to any water source. Prior to discharge, the test water would be sampled and treated, if necessary, to comply with applicable discharge requirement of permit conditions. Hydrostatic testing is further discussed in section 4.3.2.5 of this EIS.

Cleanup

Cleanup activities would include removing construction debris (i.e., including un-used and surplus materials), temporary construction structures, and equipment. Temporary erosion controls would be removed when the area has been stabilized in accordance with applicable permit requirements.

Restoration and Revegetation

Restoration would consist of returning the construction right-of-way and extra workspaces disturbed by construction activities to preconstruction contours and hydraulic regimes. Normally, final restoration would occur within 10 to 20 days of rough backfilling. Upon completion of final grading and topsoil replacement, a travel lane may be left open temporarily if the appropriate temporary erosion control structures are installed, and inspected and maintained to allow access by construction traffic. When access is no longer required, the travel lane must be removed and the right-of-way restored. However, in section 4.8.1.1, *Existing Residences*, we recommend that the travel lane not be left open through residential areas following restoration, and that restoration be completed within one week on any residential property, weather permitting. Permanent erosion and sediment controls would be installed (e.g., water bars on sloping terrain), and the work areas would be re-seeded and/or mulched pursuant to permit requirements and landowner agreements. Pipeline markers would then be installed. Soil amendments and fertilizers may be utilized where necessary. The revegetation would be monitored for at least two growing seasons following final restoration, or until successful revegetation is achieved, as defined in Mid-Atlantic Express's ECP (Appendix T).

2.3.2.2 Specialized Construction Techniques

In addition to the standard construction practices listed above, the following special construction methods and crossings would occur at appropriate locations or segments along the pipeline route.

Residential and Commercial Areas

Mid-Atlantic Express indicated that it would utilize special construction techniques in residential areas (i.e., where construction activities and/or the edge of the right-of-way are located within 50 feet or less of an active residence) by employing additional mitigation measures including restricting the construction right-of-way width. Mid-Atlantic Express would coordinate with residence owners and/or tenants prior to construction activities. Additional safety precautions would include: erecting barricades (e.g., standard orange barricade fencing), welding off site, controlling fugitive dust, and reducing the duration of the open trench.

Mid-Atlantic Express plans to start discussions with land owners during the first quarter of 2009 or later depending on the review/approval status of the project. Land agents employed by Mid-Atlantic Express would arrange meetings to discuss and negotiate easement agreements with the landowners along the pipeline route. The meetings would be arranged at the convenience of the landowners. As necessary, Mid-Atlantic Express would also dispatch engineers to work on specific concerns expressed by landowners. If issues arise, the landowner can contact Mid-Atlantic Express directly if there are complaints or specific concerns that they believe are not being addressed. Mid-Atlantic Express would prepare the easement agreements and assume costs for filing such agreements. If the landowner wishes to retain legal council to review the documentation on their behalf, then this would be at their expense.

Mid-Atlantic Express would use safety fencing that completely surrounds the work area during non-working hours. This fence would consist of an orange mesh 4-foot-high fence attached to t-posts installed every 10 to 12 feet around the perimeter of the work area. The fence would be installed to allow for safe construction as well as minimizing impact to landowner use areas. Pipeline construction in residential areas would take place during daylight working hours only. Construction/inspection personnel would perform safety monitoring during active construction, however, no monitoring would be performed during non-working hours. Appropriate cautionary signs would be installed and would be visible during active construction. See section 4.8.1.1 for additional mitigation measures and recommendations for construction in residential areas.

One special construction technique that would be used in residential or commercial areas would be stovepipe construction. Stovepipe construction is typically used where the pipeline is installed close to an existing structure or when an open trench would adversely impact a residential, commercial, or industrial area. Stovepiping would involve installing the pipeline one joint (or a double-jointed section) at a time and performing the welding, radiography, and coating activities in the open trench. At the end of each day, the trench for the newly-installed pipe would be backfilled or the open trench would be covered. The length of excavation performed each day would not exceed the amount of pipe to be installed that day.

As described in section 2.3.2.1, Mid-Atlantic Express would segregate topsoil and subsoil removed during trenching on residential properties. Due to the topsoil segregation, the pipeline would be a minimum of four feet in depth to the top of pipe and the ditch would be a minimum of seven feet deep. This would allow for padding and sandbags. In accordance with Mid-Atlantic Express's ECP, all trench spoil must be contained within the construction work area. Silt fencing would be placed around the trench spoil to ensure that stormwater runoff does not contain silt that could run off the construction area and onto lawns.

Trenchless Construction

Trenchless construction techniques could include boring, pipe-jacking, microtunneling and HDD. Trenchless methods would provide for the installation of the pipeline with minimal impacts or disturbance to surface features. Boring techniques are regularly used when crossing transportation features that cannot be disrupted (e.g., roadways, railroads). HDDs may be used when re-routing alternatives are limited and other trenching and trenchless techniques are not feasible. Mid-Atlantic Express anticipates using bores for road and railroad crossings, unless an open-cut crossing is allowed by the roadway authority.

The use of road bores would allow Mid-Atlantic Express to install specifically designed coated pipes without impacting traffic or pedestrian safety. Road bores typically require sufficiently sized bore-pits and workspace on both sides of the crossing to allow for the proper depth of the bore equipment and bore activities. Road bores also require proper "sloping and shoring" to provide a safe working area for construction personnel. After the road bore pipe is complete a drag section, which is one or more 40-foot sections that would be brought forward to tie into the road bore pipe, would be installed. The drag section would be installed and backfilled so the time that it is exposed to outside conditions in minimized.

An HDD would involve drilling a pilot hole underneath the waterbody and then enlarging the hole until the hole is large enough to accommodate the pipe. Bentonite drilling fluid is delivered to the cutting head through the drill string to provide the hydraulic cutting action, lubricate the drill bit, stabilize the hole, and remove cutting spoil as the drilling fluid returns to the entry point. Pipe sections would be staged and welded along the right-of-way and then pulled through the bore hole. Because the pipe must be pulled down and through the bore hole, bending to fit the contour of the hole, this technique is generally used only for major crossings.

Multiple commenters have asked that the HDD method be used to cross sensitive waterbodies in both Maryland and Pennsylvania. The selection of the HDD method depends upon many factors, but the four most important criteria are: 1) the minimum bend curvature of the pipe; 2) the underlying geology of the area; 3) the necessary space for the entry and exit equipment, and for the pipeline pull string (i.e., the welded pipe before it is pulled through the drilled underground passage); and 4) the fact that the pipe cannot be laid underneath occupied structures. In addition, cost is greater per linear foot of installed pipe for HDDs versus open cut construction. For the first criteria, for 30-inch outside diameter pipe, the minimum distance to curve the pipe into the ground, go below the feature being avoided (such as a stream bottom), and curve back to the ground surface is approximately 1200 feet. That is, on equal elevations for the entrance and exit points to go below a waterbody bed, with a safety measure for burying the pipeline below the scour depth, the pipeline would need to go about 42 feet minimum below the entry and exit elevations. For the second criteria, the underlying geology cannot have great discontinuities such as a glacier boulder field, or a disparity of geological strata such as bedrock to soft sediments. For the third criteria, the HDD must have space for a 100 by 200 foot area for the entry and exit work areas, preferably removed from residences. There must also be a straight area on the exit side of the hole, about equal in distance to the length of the HDD for laying down and welding pipe that would be pulled into the hole. Thus for a 1200-foot-long HDD, you need an approximately 1200-foot-long pipe welding area unless the HDD pull string is broken into multiple sections, which can be done in exceptional circumstances. The fourth criteria means that the HDD path must not pass underneath occupied structures such as residences, businesses or commercial structures. Thus, on the horizontal plane, the HDD path must, with small exceptions, be along a straight line. These criteria constrain where HDD can be used and where it cannot.

Mid-Atlantic Express anticipates using the HDD method for specific stream crossings, such as Back River at MP 9, the Little Gunpowder Falls and associated wetland at MP 22, and the Susquehanna River at MP 44. These crossings are analyzed in greater detail in section 4.3.2.5. Pending the completion of field reviews of the pipeline alignment(s) by the COE, the COE may require additional trenchless crossings of other waters of the United States. In addition, NMFS, EPA, and COE have requested evaluation of using HDD crossings at limited additional locations. Specific geotechnical investigations and engineering reviews would be conducted to assess feasibility of such HDD crossings. Mid-Atlantic Express has stated that the geotechnical investigations of Back River, the Susquehanna River, and Little Gunpowder Falls would be completed prior to completion of detailed design and construction, and that a summary of these investigation results would be provided to FERC, prior to construction. In June 2008**,** AES committed to an HDD Geotechnical Investigation Plan with a timeline for completion depending upon land access. AES has continued to keep the FERC informed of access issues for each site. See section 4.3.2.5 for further information about the waterbody crossings that Mid-Atlantic Express has committed to complete by HDD, other waterbodies for which HDD is being considered, and our recommendations regarding the filing of geotechnical investigation results.

Waterbody Crossings

Water flow would be maintained at all waterbody crossings. Project-specific impacts on waterbodies are addressed in section 4.3 of this EIS. Typically, waterbody crossings would be perpendicular to the stream flow. Grading at approaches to waterbodies might be required to create a safe work surface and to allow the necessary area for pipe bending. If grading is required, it would be directed away from the waterbody (that is, into vegetated areas alongside the construction right-of-way) to reduce the possibility of disturbed soils being transported into the waterbody by erosion or sheet flow.

Temporary bridges, called equipment bridges, would be placed across waterbodies that have perceptible flow at the time of construction with the exception of waterbodies that are too wide to bridge or that would be directionally drilled. All construction equipment, except clearing and trenching equipment, would use the equipment bridge to cross the waterbody. Equipment bridges may consist of prefabricated construction mats, rail flat cars, flexi-float or other temporary bridges (Bailey bridges), or flume installations.

Flume installation would include suitably sized flumes and a travel surface consisting of rock fill, sand bags, timber mates, or timber riprap. At all equipment bridge locations, care would be taken to minimize disturbance of the stream bank and bottom. Typically, equipment bridges would be installed during the clearing and grading operation.

At all waterbody crossings, provided rock is not encountered, Mid-Atlantic Express would place the pipeline deep enough to avoid reasonable scour predictions or a minimum of five feet below the stream/river bottom. Where practical, material excavated from the trench would be stockpiled above the stream banks and generally used as backfill unless federal or state permits specify differently. In addition, any excess material would be removed from the waterbody and the original contour would be restored. Containment structures for the removed material would typically be silt fences and/or straw bales and would serve to minimize the potential for soil entering the waterbody. Concrete weights or coatings on the pipe might be required to provide negative buoyancy at waterbody crossings and in floodplains.

Typically, construction activities at a minor stream crossing would be completed within 24 to 48 hours. The introduction of sediment into the waterbody from disturbed upland areas would be minimized by placing and maintaining sediment barriers (silt fences and/or straw bales) at the waterbody crossing.

Construction at waterbody crossings would be performed in accordance with the Mid-Atlantic Express's ECP (see Appendix T) and applicable permit conditions, unless more stringent state or local regulatory requirements apply, or unless field-specific variances are granted by the FERC. Through consultations with the COE, it was brought to our attention that the use of riprap to control stream bank erosion, as indicated in figure 22 of Mid-Atlantic Express's ECP, would require site-specific approval by the COE prior to implementation. We believe that figure 22 should clearly state this, in order to avoid any confusion in the field during construction activities. Therefore, **we recommend that**:

- **Prior to construction, Mid-Atlantic Express obtain prior, written, site-specific authorization from the COE to use riprap as a stream bank stabilization method and revise note No. 4 on figure 22 of its ECP to indicate this.**

Multiple state and local resource agencies have requested that Mid-Atlantic Express consult with them to select appropriate waterbody crossing methods for sensitive waterbodies. We reviewed Mid-Atlantic Express's proposed stream crossing methods in section 4.3.2.5 and in Appendix I. Generally, we have concluded that Mid-Atlantic Express has correctly chosen flume or dam and pump crossing methods for sensitive waterbodies. Either of these methods mean that, although the cut through the stream bed is an open trench, the construction is done as a "dry crossing" since the flow of the water is maintained by bypass across the construction area. Additionally, Mid-Atlantic Express has committed to constructing outside seasonal windows that are critical to aquatic organisms (see Appendix I). We address other specific requests for specialized waterbody crossing methods in sections 4.3.2.5 and 4.6.3.

Wetland Crossings

Wetland construction would be conducted in accordance with Mid-Atlantic Express's ECP, (Appendix T). AES and Mid-Atlantic Express would employ appropriate BMPs to minimize the potential for impacts to wetlands and waterbodies. We have reviewed the ECP and found it to be acceptable, except as noted above. Project-specific impacts on wetlands are discussed in section 4.4 of this EIS.

In general, where soils are unstable and saturated, stable temporary work surfaces may be constructed in wetlands. Board roads or travel pads on geotextile fabric are possible methods of stabilization. ATWSs would be located a minimum of 50 feet from the edge of delineated wetlands. MDE indicated that temporary construction trailers, staging areas, and stockpiles would not be placed in nontidal wetlands, nontidal wetland buffers, or the 100-year nontidal floodplain, unless approved by MDE. If a riparian wetland is located adjacent to a waterbody, extra workspace may be requested and placed in a wetland, if approved by the FERC and other appropriate agencies. This would be reviewed on a case-by-case basis. Within wetlands, vegetation would be cut to ground level. Grading and stump removal would be performed only over the trench, except where safety considerations dictate additional removal on the working side of the right-of-way.

The construction procedures to cross unsaturated wetlands would be similar to those used in upland areas. Topsoil would be segregated in unsaturated wetlands in the same manner as agricultural lands. If the trench contains water, ditch plugs would be left in the trench prior to its entrance to the wetland. The ditch plugs would be designed to minimize sediment discharges into the wetland from upland areas. Points at which the trench enters and exits the wetland would be sealed with trench sack breakers or foam breakers to maintain the hydrologic integrity of the wetland wherever deemed necessary by qualified Mid-Atlantic Express representatives and verified by our third-party monitors (see section 2.5). Silt fences and/or straw bales would be installed at edges of the construction right-of-way in wetlands where there is a possibility for spoil to flow into undisturbed areas of the wetlands. Backfill would be well compacted, especially near the edges of wetlands. Original topographic conditions and contours would be restored after the completion of construction.

Mid-Atlantic Express has proposed two alternative methods to construct for specific instances in wetlands – the push-pull method, and the drag section method. The push-pull technique would be employed in wetlands with standing water or saturated surface soils. This technique generally requires a narrower right-of-way and minimizes the operation of construction equipment within wetlands. A trench is excavated using either a backhoe (based on equipment support) or a dragline or clamshell dredge. The equipment would push the prefabricated pipe from the edge of the wetland and/or pull (using a winch) the pipe from the opposite wetland bank into the excavated trench. Buoyancy devices may be affixed to maneuver the pipe into the trench and removed after placement.

The drag section technique would involve equipment carrying a prefabricated section of pipe into a saturated wetland. A stable work surface would be provided through the installation of equipment support (e.g., timber rip-rap or prefabricated equipment mats) which would also minimize soil disturbances and rutting.

Mid-Atlantic Express would follow additional mitigation measures to reduce or minimize impacts to wetlands. Specifically Mid-Atlantic Express would:

- limit the construction equipment operating in the wetland or other waters of the U.S. to that which is necessary to complete construction;
- facilitate revegetation by leaving existing root systems in place except over the trench and where safety considerations require their removal;
- segregate topsoil from the trench in unsaturated wetland soils;
- install and maintain sediment barriers across the entire construction right-of-way and along the edges of the right-of-way as necessary to prevent sediment from entering wetlands or other waters of the U.S.;
- return the top 12 inches of topsoil removed from trenches to the trench unless the presence of tree roots, stumps, standing water or saturated soil precludes topsoil segregation;
- restore original contours and flow patterns;
- not dispose of excess fill material resulting from trench/pipeline construction in wetlands or other waters of the U.S. unless expressly approved by the COE;
- reseed wetland areas impacted by construction with annual ryegrass supplemented with a native seed mix to preclude erosion and to establish a temporary vegetative cover until native seed and rhizomes are established from the seed bank in the topsoil;
- monitor the wetland for three years and, if vegetation has not been re-established, develop and implement a remedial vegetation restoration plan;
- use construction BMPs to minimize the impacts to wetlands through the use of rippers, back-hoe mounted hammers, and blasting, should wetlands be encountered above shallow bedrock;
- limit the width of the construction right-of-way to 75 feet through non-cultivated wetlands;
- limit grading or pulling of tree stumps in wetlands to directly over the trench line, except where necessary to ensure safety;
- minimize the length of time that topsoil is segregated and the trench is open;
- prohibit storage of hazardous materials, chemicals, fuels, and lubricating oils within waters of the U.S. and wetlands or within 100 feet of a water of the U.S, or wetland boundary; and
- limit post-construction maintenance of vegetation within herbaceous wetlands to a 10-foot-wide strip of vegetation centered over the pipeline; and in forested areas, limiting tree removal to those that are greater than 15 feet in height and within 15 feet of the pipeline centerline.

Roads and Railroads

Mid-Atlantic Express would construct road and railroad crossings in compliance with state and local regulations and in accordance to rights-of-way agreements with the entity that holds the transportation easement. In instances where major roads or railroads could not be interrupted by pipeline construction, Mid-Atlantic Express would cross these features using trenchless construction techniques (e.g., boring). Mid-Atlantic Express anticipates using bores for road crossings except where, following consultation with the appropriate authority (e.g., town, county) an open-cut crossing is determined to be feasible and safe to the commuting public. Railroad crossings and many hard-top public roads would be crossed by boring (not to be confused with HDD). Minor roadways and drives would be crossed by open trenching. Once completed, roadways would be restored in accordance with engineering specifications, to preconstruction conditions or better.

Furthermore, when construction activities would occur within public roadways, provisions would be made for appropriate signage and, when necessary, temporary detours or other traffic control measures would be established to allow safe traffic flow during construction.

Blasting

It may be necessary to perform blasting in areas with shallow bedrock. Before a decision is made to blast, Mid-Atlantic Express has indicated that it would investigate other rock excavation techniques including rock saws, hydraulic hoe hammers and ripper teeth. Where blasting is the chosen method to remove shallow bedrock, the work would be performed by licensed contractors utilizing appropriate safety precautions. Blasting procedures would include: notification requirements, controls to prevent and/or minimize fly-rock, and procedures to minimize environmental impacts. Potential impacts from blasting are discussed in section 4.1.1.2. Areas with the potential for shallow bedrock and where potential blasting construction techniques may be utilized are identified in section 4.1.1.2. Specific details regarding blasting procedures would be known after the construction contractors have been selected and have had an opportunity to review blasting locations and propose methods based on site-specific evaluation.

2.4 CONSTRUCTION SCHEDULE

According to the schedule in the draft Consolidated Dredge Plan (CDP) (Appendix D), and assuming receipt of all required regulatory approvals and permits, AES would begin construction of the LNG Terminal in the first quarter of 2009. It would take approximately 34 months (including the overlap with site preparation) and would be completed in 2011 (see table 2.4-1). Separate crews would be utilized for the construction of the LNG tanks, marine facilities, LNG process facilities, and for offshore dredging activities; therefore, many of these construction activities would be undertaken simultaneously.

TABLE 2.4-1

Estimated Construction Schedule a/

Construction Activity	Estimated Start	Duration (months)	Estimated End
LNG Facilities Construction b/			
Site Work	Qtr 1 2009	6	Qtr 2 2009
Facility Construction	Qtr 1 2009	32	Qtr 4 2011
Dredging and Processing Dredged Material			
Dredging	Qtr 1 2009	21	Qtr 4 2010
Process Dredge Material	Qtr 1 2009	22	Qtr 4 2010
Stockpile and Remove Material	Qtr 2 2009	31	Qtr 4 2011
Pipeline Construction			
Procurement	Qtr 3 2009	9	Qtr 1 2010
Construction	Qtr 1 2010	11	Qtr 1 2011

a/ All start estimates assume receipt of all necessary permits and authorizations; delay of the start would change the ending time period.
b/ The site work and facility construction of the LNG terminal overlap 4 months; total duration is 34 months

Assuming receipt of all regulatory approvals and permits, dredging of the approach channel and turning basin could begin the first quarter of 2009 and would take 21 months. Collectively (accounting for an overlap of activities) the processing and removal of dredged material would take about 34 months. These activities would begin in the first quarter of 2009 and end approximately the fourth quarter of 2011.

Mid-Atlantic Express anticipates that, assuming receipt of all required regulatory approvals and permits, pipeline construction would commence in the first quarter of 2010, and could be completed in the first quarter of 2011. The pipeline work is expected to be completed during one construction season with the use of multiple construction spreads. If restoration could not be completed by the 15th of November of the year of final construction, a winterization plan would be implemented to stabilize and monitor disturbed areas through the winter and subsequent spring thaw. All restoration activities would be completed by no later than the year following construction.

2.5 ENVIRONMENTAL COMPLIANCE, INSPECTION, AND MITIGATION MONITORING

Under the NGA, the FERC may impose conditions on any Certificate it grants for the Project. These conditions include additional requirements and mitigation measures recommended in this EIS to minimize the environmental impact that would result from the construction and operation of the Project (see summary in section 5). We will recommend these additional requirements and mitigation measures (bold type in the text) be included as specific conditions to any Certificate the FERC may issue for the Project. We will also recommend that AES and Mid-Atlantic Express be required to implement the mitigation measures that they have proposed as part of the Project unless specifically modified by other Certificate conditions (see recommendation 1 in section 5.2).

AES stated that inspections would be performed by an Environmental Inspector (EI) retained by AES (one per spread). Additionally, the Commission would implement and manage a third-party Environmental Compliance Monitoring and Reporting Program (ECMR Program), which AES has agreed to fund. We believe a third-party program of inspection and monitoring provides a number of benefits, both to agencies and to applicants. The overall objective of the ECMR Program is threefold:

- to assess environmental compliance during construction in order to achieve a high level of environmental compliance throughout the Project;
- to assist the FERC staff in screening and processing variance requests during construction; and
- to create and maintain a database of daily reports documenting compliance and instances of non-compliance.

Other federal and state agencies may also conduct oversight of construction and restoration to the extent determined necessary by the individual agency. Additional monitoring for sea turtles and shortnose sturgeon is addressed in section 4.7.1. After construction is completed, we would continue to conduct oversight inspection and monitoring of the Project.

The purpose of the AES-hired EIs would be to ensure environmental compliance on behalf of AES. In contrast, the purpose of the third-party monitors would be to monitor the activities of AES's EIs and construction contractor on behalf of the FERC, to provide continual feedback on compliance issues to the FERC staff, and to track and document progress of construction by the preparation and submittal of reports to the FERC on a regular and timely basis.

2.6 OPERATION AND MAINTENANCE PROCEDURES

2.6.1 LNG Terminal

Formal commissioning of the LNG terminal would begin after completion of all testing, flushing and checkout of piping, equipment and instrumentation and control equipment. The commissioning would be performed in accordance with detailed engineering and operating procedures, with steps including dryout and purge of all process systems, cooldown, and initial inventorying of one of the LNG storage tanks.

Imported LNG would originate at liquefaction plants at foreign ports throughout the world and would be delivered via LNG ships to the Sparrows Point LNG terminal. At least 96 hours prior to arrival, each LNG ship would notify the terminal and the Coast Guard of its scheduled arrival. In addition, prior to entering Chesapeake Bay, the LNG ship would give advance notice to: the U.S. Navy, PAX; Immigration and Naturalization Service; the Association of Maryland Pilots and Association of Virginia Pilots; tug operators; and shipping agents. In accordance with the WSR, AES would be required to complete its TMP which would contain the procedures it would implement for all loaded LNG takers. The TMP would specify the responsibilities and actions of all participating entities.

The transit route of the LNG ships from the entrance of the Chesapeake Bay to the terminal site at the Sparrows Point peninsula would cover about 164 nautical miles. See section 4.12.5.4 for information about the transit route, and see Appendix K for the figures for the proposed LNG marine traffic route to the proposed terminal. Additional figures have been added to Appendix K to identify the outermost boundaries of a corridor through which an LNG vessel could travel along the waterway, in addition to the figures from the draft EIS describing the proposed vessel transit route.

Consistent with existing pilotage rules, all inbound LNG ships bound for the proposed Sparrows Point LNG Terminal would take on a licensed Maryland Pilot prior to entry into the Chesapeake Bay, and would be under the control of the Maryland Pilot for the entire transit through the Chesapeake Bay. The Maryland Pilot would embark the LNG ship in the Precautionary Zone of Chesapeake Bay Traffic Separation System approximately two nautical miles off Cape Henry, Virginia. In addition, a docking pilot would embark the LNG ship in the vicinity of Cut-Off Angle, which connects Craighill Upper Range Channel to Brewerton Channel, to direct the ship the remaining 5 nautical miles to the facility dock. Tugs would also meet the ship at Cut-Off Angle to assist the ship for that portion of the transit.

The turning basin and approach channel would provide an access point for approaching LNG ships from the existing Brewerton Channel to the southwest. The speed of the incoming LNG ship would be gradually reduced during its transit of the Brewerton Channel until, by the time it reaches the entrance of the approach channel to the LNG terminal, it would have been slowed sufficiently to operate safely in the waters adjacent to the LNG Terminal. The tugs would assist the ship to turn into the approach channel. The incoming vessel would transit the approach channel under active tractor tug control. The LNG ship would be brought to full stop in the approach channel, and with tug assistance it would be turned and berthed at either berth with the bow pointing out. Security zones, to be determined by the Coast Guard, would be enforced by security escort boats along the waterway. Passage of LNG vessels under the Bay Bridge would have additional risk mitigation, such as the presence of a 70-ton bollard pull tug (see section 4.12.5.5).

The departure procedures for LNG ships would be similar to those for the incoming transiting LNG ships as described above, except that the outgoing vessels would not need to be rotated in the turning basin. Specifics on the transit of LNG vessels and other waterway traffic would be detailed in a TMP; the development of the TMP would include input from port stakeholders, AES, and Cove Point LNG Terminal.

AES would develop procedures to operate all LNG terminal facilities in accordance with governmental regulations, permit requirements and authorizations, manufacturer recommendations, and AES's own corporate procedures. These procedures would address operations, maintenance and safety requirements for LNG terminal activities, including routine activities (operations and maintenance) and non-routine activities (startup of equipment, cool-down of idle equipment prior to restart, troubleshooting, and emergency response). The procedures would be provided in manuals and LNG terminal personnel would be trained in their use, as well as to respond to abnormal occurrences and emergencies.

Based on current sediment depositional rates in the area, AES estimates that maintenance dredging of approximately 500,000 CY would be necessary every six years to maintain the design depth of the approach channel and the turning basin. The COE permit would require that AES test the sediments to be dredged prior to each maintenance dredging cycle. Dredging is addressed in section 2.3.1.3.

2.6.2 Pipeline Facilities

All pipeline facilities would be designed, constructed and operated in accordance with the DOT regulations in 49 CFR 192 and other applicable federal and state regulations. The pipeline would be patrolled from the air and/or ground on a periodic basis also in accordance with 49 CFR 192. This patrol would provide information on possible leaks, encroachment into the right-of-way, third-party construction activity near the pipeline, erosion, waterbody crossings, exposed pipe, or population density changes in the vicinity of the pipeline.

Cathodic protection test stations, rectifiers, and pipeline markers would be located along the right-of-way and installed in accordance with 49 CFR 192. The markers would identify Mid-Atlantic Express as the operator and would list telephone numbers for emergencies and inquiries. These identification markers would be located at regular intervals adjacent to road crossings but within the permanent right-of-way. Mid-Atlantic Express would also participate in the local one-call system. Mid-Atlantic Express would establish and maintain liaisons with appropriate local emergency response entities concerning pipeline emergencies (also see section 4.12.9). Maintenance would include periodic seasonal mowing of the permanent right-of-way, vegetation control around aboveground facilities, and the repair of erosion control structures as necessary in a manner consistent with Mid-Atlantic Express's ECP.

2.7 SAFETY CONTROLS

2.7.1 LNG Terminal

The LNG terminal would be sited, designed, constructed and operated in compliance with federal safety standards. Federal siting and design requirements for LNG facilities are summarized in table 2.7.1-1.

TABLE 2.7.1-1

Federal Siting and Design Requirements for LNG Facilities

Requirement	Description
Thermal Radiation Protection (49 CFR 193.2057 and NFPA 59A, Section 2.2.3.2)	Designed to ensure that certain public land uses and structures outside the LNG facility boundaries are protected in the event of an LNG fire.
Flammable Vapor-Gas Dispersion Protection (949 CFR 193.2059, and NFPA 59A, Sections 2.2.3.3 and 2.2.3.4)	Designed to prevent a flammable vapor cloud associated with an LNG spill from reaching a property line for a property that can be built upon.
Wind Forces (49 CFR 193.2067)	Specifies that all facilities be designed to withstand wind forces of not less than 150 mile per hour without the loss of structural integrity.
Impounded Liquid (NFPA 59A, Section 2.2.3.8)	Specifies that liquids in spill impoundment basins cannot be closer than 50 feet from a property line for a property that can be built upon or closer than 50 feet from a navigable waterway.
Container Spacing (NFPA 59A, Section 2.2.4.1)	Specifies that LNG container [tanks] with capacities greater than 70,000 gallons must be located a minimum distance of 0.7 times the container diameter from the property line or buildings.
Vaporizer Spacing (NFPA 59A, Section 2.2.5.2)	Specifies that integral heated vaporizers must be located at least 100 feet from a property line for a property that can be built upon and at least 50 feet from other select structures and equipment.
Process Equipment Spacing (NFPA 59A, Section 2.2.6.1)	Specifies that process equipment containing LNG or flammable gases must be located at least 50 feet from sources of ignition, a property line for a property that can be built upon, control rooms, offices, shops, and other occupied structures.
Marine Transfer Spacing (33 CFR 127.105)	Specifies that each LNG unloading flange must be located at least 985 feet from any bridge crossing a navigable waterway.
Proximity to Airport Runways (49 CFR 193.2155)	Specifies that an LNG storage tank must not be located within a horizontal distance of 1 mile from the ends of, or 0.25 mile from the nearest point of an airport runway, which ever is longer.

2.7.1.1 Spill Containment System

The LNG terminal would have a spill containment system that would comply with 49 CFR 193 and with NFPA 59A. Specifically, the unloading area would have a sump designed to contain at least a spill that would result from a failure of the 32-inch LNG unloading pipeline for a period of 10 minutes. AES has engineered a concrete containment sump that can hold 88,200 cubic feet (660,000 gal) of LNG. LNG spills would flow along insulated concrete troughs beneath the LNG transfer pipes leading to the LNG storage tanks.

In accordance with the requirements of NFPA 59A, the spill containment sump would include a sub-basin in order to retain and remove rain water from the sump. This basin has been sized to contain and remove water up to 25 percent of the rate of collection from a maximum storm of a 10-year frequency and 1-hour duration.

For each of the full containment storage tanks, the outer shell would be capable of containing 110 percent of the volume of the inner tank.

2.7.1.2 Fire and Hazard Detection System

A hazard detection and mitigation system would be installed that would continuously monitor and alert the operator regarding hazardous conditions resulting from fire, combustible gas leaks, or low temperature LNG spills throughout the terminal. The main control room and the platform control room would be provided with monitors to display graphic information on these safety systems.

The LNG terminal would have a dedicated system for monitoring fire, heat, combustible gas, smoke or combustible product and low temperature product detection. Fire and gas detection and protection of offices and other buildings would be controlled via fire panels located in individual buildings networked to a master fire and gas detection panel located in the main control room.

2.7.1.3 Fire and Hazard Control System

The LNG terminal design would include a fire fighting system composed of a fixed fire water system (hydrants and hose reels), a fixed and portable dry chemical extinguishing system, and a high expansion foam system. The primary components of the fire water system would include:

- a fire water tank with storage capacity of 360,000 gallons;
- electrical and diesel fire pumps (one each), each designed to supply the entire 3000 gallons per minute fire water demand;
- a jockey pump used to maintain system pressure in the fire water system; and
- seawater fire pumps to draw water from the Patapsco River as emergency backup to the standard fire water system supply.

The dry chemical system would consist of a combination of total flooding systems, local application (fixed nozzle and/or hose line systems), and/or portable extinguishers (both hand-held and wheeled). Dry chemical systems are effective against hydrocarbon pool and three-dimensional fires (e.g. jet fires), particularly those fires involving pressurized natural gas or LNG spills. The dry chemical agent specified by AES is potassium bicarbonate. The dry chemical systems would be located in strategic locations, primarily in the LNG process, the marine unloading, and the LNG storage areas.

2.7.1.4 Emergency Shutdown System

The LNG terminal would have an emergency shutdown (ESD) system that would provide for the safe, sequential shutdown and isolation of rotating equipment, vaporization equipment, pier operations and LNG storage facilities. ESD stations would be installed at various locations throughout the terminal and would include the ship unloading systems, the natural gas sendout systems and additional specific process and storage equipment. Depending upon the type of incident, the ESD system would be used for major incidents and would result in total shutdown of the LNG terminal, shutdown of ship unloading, shutdown of gas sendout, and/or shutdown of individual equipment.

2.7.1.5 LNG Transfer Monitors and Vessel Inspections

Preliminary transfer inspections shall be completed by the facility person in charge (PIC) in accordance with 33 CFR 127.315. Warning signs must be in place as prescribed in 33 CFR 127. An inspection of the offshore generator room would be conducted and the fire main engaged. The PIC shall ensure platform fire fighting appliances are operable and free of ice and offshore halon racks are fully charged. A nitrogen leak test of the vessel manifold to facility loading arm connections shall be completed. Drip pans, water curtains, or other forms of hull protection must be in place under cargo manifold connections and the vessel fire systems must be operable (hoses made ready and free of ice). Emergency tow cables shall be led to the waters' edge. Under no circumstance would cargo be vented to the atmosphere. One towing vessel would remain on scene in immediate standby (capable of getting underway in less than one minute), and two additional towing vessels would be available in 10-minute standby. In an emergency, e.g., fire at the terminal, the mooring lines would be released and the tugs could immediately get the LNG vessel off of the dock and away from the threat. All emergency shutdown systems must be operable. The Terminal Operator and Vessel Operator would be required to test the emergency shutdown systems before beginning a cargo transfer. Adequate personnel would be on duty at all times; two rested cargo officers, one additional deck officer, and two deck hands. Those directly involved with the transfer must speak and understand English. No stores shall be loaded/unloaded during cargo transfer unless the loading/unloading of stores does not present a hazard to the LNG transfer operations. Ship to Shore communications would be tested and operable. A pre-transfer conference must be held and a Declaration of Inspection and Declaration of Security completed. A Coast Guard cargo transfer monitor team may observe the tests of the emergency shutdown systems. LNG vessels would be inspected per the requirements of 46 CFR 154, other international and domestic requirements, and Coast Guard inspection policies. If a LOR finding the waterway suitable for LNG vessel traffic is issued by the Coast Guard, qualified Coast Guard Port State Control Officers would conduct LNG vessel examinations in accordance with Coast Guard policy to ensure compliance with various international and domestic regulations. Typical examinations would include, but would not be limited to, reviewing vessel documentation, conducting navigation safety checks, evaluation of the vessel's safety management system, the vessel's security systems, conducting a deck walk to evaluate the condition of structures, steering gear tests, oily water separator tests, firefighting detection and related equipment, and conducting fire and abandon ship drills. More in-depth guidance on inspection policy and procedures can be found in: the Marine Safety Manual Volume II Chapter 6, International Maritime Organization (IMO) publications; the U.S. CFR; the Coast Guard Port State Control Job Aid; and applicable Coast Guard Navigation and Inspection Circulars.

2.7.1.6 Security Zones

Two COTP zones are established for the Chesapeake Bay per Title 33, CFR §165.500 and §165.503. As described in 4.8.4.1, the COTP Hampton Roads Zone covers from the mouth of the Bay to the Virginia-Maryland border, and the COTP Baltimore Zone covers waters inside Maryland. The provisions in Title 33, CFR §165.503 which may allow vessels traveling at minimum safe navigation speeds to approach within 500 yards of an LNG carrier are applicable within the COTP Hampton Roads Zone. Similar provisions are not contained in the safety/security zone regulations specified in 33 CFR §165.500 for the COTP Baltimore Zone. However, the COTP Sector Baltimore has stated its intention would be to also establish a similar Regulated Navigation Area under Title 33, CRF, §165.500. As stated in the WSR, no vessel may enter the safety and or security zone without first obtaining permission from the cognizant COTP. It should be noted that the regulations in §165.500 and §165.503 apply to vessels transporting LNG. According to the Coast Guard, outbound LNG vessels that have discharged LNG cargo at the terminal would not be subject to this security/safety zone regulation.

Also specified in the WSR and the October 24, 2008 letter from the Coast Guard (see Appendix J), loaded LNG vessels would not be permitted to overtake, cross, meet in a head-on situation, or otherwise operate in close proximity to high capacity passenger vessels while in the COTP Baltimore zone (see section 4.12.5.4).

2.7.2 Pipeline Facilities

2.7.2.1 Corrosion Protection and Corrosion Monitoring

The pipeline would be made of carbon steel pipe manufactured in accordance with the API specifications for seamless and welded steel line pipe for use in the natural gas pipeline industry (API 5L). The pipe would be coated with fusion-bonded epoxy to protect against external corrosion. The pipeline would also be protected by an impressed current cathodic protection system. This cathodic protection system would be periodically tested for operational effectiveness by measuring the pipe to soil electrical potential. Annual monitoring of the effectiveness of the cathodic protection system at test stations along the pipeline is a requirement of DOT regulations. Additional cathodic protection monitoring can include close interval surveys (CIS) which involves walking the pipeline right-of-way with monitoring instruments. In addition, AES would be required to comply with DOT regulations (49 CFR 192) regarding integrity management systems. These regulations require periodic inspection of the internal pipe condition and wall thickness of the pipe to prevent failures due to installation damage, weld imperfections or internal corrosion as well as to detect potential pipe deformation due to external damage.

2.7.2.2 Emergency Response Procedures

Pipeline system emergencies can include gas leak, fire or explosion, and damage to the pipeline or aboveground facilities. In compliance with DOT regulations, AES would develop a plan to address procedures to be followed in the event of an emergency. The plan would address employee training, coordination with appropriate fire, police, and other local community officials, and information to be provided to the public to instruct individuals how to identify and report an emergency condition along the pipeline route.

2.8 FUTURE PLANS AND ABANDONMENT

At the current time, AES does not foresee future plans to expand the Project beyond the scope discussed in this section. However, certain design aspects have been engineered to allow AES to expand the facilities if market conditions change such that an expansion is justified. AES indicated that the LNG terminal equipment and site design layout could support a fourth tank installation, and could easily support an upgrade in system vaporization and sendout capacity up to 2.25 Bcfd. According to Mid-Atlantic Express, the pipeline has been engineered to handle this throughput without major modifications.

The design life of the Project is 25 years. Continued operation beyond 25 years may be viable, depending upon market viability and facility conditions. Additionally, at some time in the future, the Sparrows Point facilities could be decommissioned and abandoned, but the circumstances and timing are not known with any reasonable accuracy. Such an action would require an application to and approval by FERC. Mid-Atlantic Express would develop a decommissioning and abandonment plan in advance of abandoning the facilities in accordance with FERC regulations.