

APPENDIX O
EXOTIC AND INVASIVE SPECIES CONTROL PLAN



**AES SPARROWS POINT LNG, LLC
AND
MID-ATLANTIC EXPRESS, LLC
LNG TERMINAL AND PIPELINE PROJECT**

***EXOTIC AND INVASIVE SPECIES
CONTROL PLAN***

(DRAFT)

JULY 2007

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1.0 INTRODUCTION

AES Sparrows Point LNG, LLC (Sparrows Point LNG) proposes to construct, own, and operate a new liquefied natural gas (LNG) import, storage, and regasification terminal (LNG Terminal) at the Sparrows Point Industrial Complex situated on the Sparrows Point peninsula east of the Port of Baltimore in Maryland. LNG will be delivered to the LNG Terminal via LNG marine traffic, offloaded from these ships to shoreside storage tanks, regasified on the LNG Terminal site (Terminal Site), and transported to consumers via pipeline.

The Project footprint is located in the counties of Baltimore, Harford and Cecil in Maryland, and in the counties of Lancaster and Chester in Pennsylvania. The Terminal Site, which is located entirely within Baltimore County, is a parcel located within a former shipyard. The route proposed for the Pipeline (Pipeline Route), which crosses all of the listed counties, includes industrial, commercial, agricultural, and residential lands. Together, the Terminal Site and the Pipeline Route comprise the Project Area.

The linear nature of the Project may provide exposed topsoil for potential recruitment of exotic and invasive species and the potential exists for equipment to bring in and inadvertently introduce invasive species to areas without existing infestations. In order to counteract this potential introduction, AES will implement the following strategies as well as several industry-accepted measures for controlling exotic and invasive species.

2.0 EXOTIC AND INVASIVE SPECIES CONTROL PLAN

2.1 IDENTIFICATION OF EXISTING INFESTATIONS

Prior to the initiation of construction, AES will perform a review of existing environmental data and conduct a walkover of the proposed right-of-way to identify wetlands and other areas that contain populations of exotic and invasive species. Field teams will photo-document the presence of these populations and characterize the general condition and density of the population. This information will be used to identify areas that are not infested and thus subject to the invasive species control plan, as well as those areas that are already infested and will not require control measures.

2.2 MINIMIZATION OF IMPACT

The first strategy will be to minimize the introduction of species, which were not documented in the pipeline corridor during pre-construction environmental surveys. To accomplish this, AES is requiring all contractor equipment to be washed before arriving at the job site or contractor yards.

The second strategy will involve monitoring and selective spot treatment/eradication of any exotic and invasive species encountered in construction. AES proposes to monitor the ROW for the first 3-5 years, as part of the annual FERC-required revegetation-monitoring program, to allow for early detection of exotic and invasive species infestation. If species or colonies of species are documented in numbers and/or percentage of ground cover, which are significantly different from existing nearby off ROW locations, AES will conduct spot eradication of those species. Eradication and control could include physical methods (*e.g.*, hand pulling, grubbing, girdling, mowing, or cutting) or chemical methods (*e.g.*, application of herbicides) as necessary (discussed in sections 2.1 and 2.2).

Additional control measures that will be used to minimize introduction and spread of exotic and invasive species include:

- Follow FERC's Plan and Procedures to assure that sediment movement and the associated movement of non-native seeds into newly disturbed soils are minimized.
- Use construction techniques along the pipeline route that minimize the time that bare soil is exposed and, therefore, minimize the opportunity for exotic species to become established.
- In wetland construction areas where practicable, remove topsoil from the excavation areas and store it to the side for replacement once the construction is complete. This will minimize the introduction of non-native species and maintain the native plant seed bank.
- Sow a quick growing cover crop (such as annual ryegrass) in wetlands and along all exposed soil surfaces within a short time to assure that a suitable growing substrate for exotic or invasive species is not available for long periods of time.

2.3 PHYSICAL CONTROL AND ERADICATION METHODS

Hand Pulling and Grubbing

This method will be most appropriate for small initial populations of Japanese barberry, Asiatic bittersweet, tartarian honeysuckle, purple loosestrife, common reed, Japanese knotweed, European buckthorn, glossy buckthorn, and poison ivy, at the early stage of infestation (Plant Conservation Alliance 2000). Using a small digging tool and/or gloved hand, the entire plant shall be removed including all roots, runners and mature fruit. Some plants may be hand-pulled depending on the maturity of the plant and soil conditions. Care will be taken to attempt to remove the entire root system to prevent re-sprouting (Tennessee 1997), and to avoid excess disturbance to soil to minimize the release of seeds stored in soil (Plant Conservation Alliance 2000). The uprooted plant materials shall then be bagged and disposed of in an appropriate container or approved offsite location to prevent re-introduction into the wetland (Tennessee 1997 and Plant Conservation Alliance 2000).

Girdling

For several invasive species (e.g., European and glossy buckthorn, and Japanese barberry), girdling will be used for small populations of mature plants where grubbing would be prohibitive due to the diameter of the stems and extent of root growth. Girdling involves removing a two-inch wide strip of bark and cambium around the entire stem (Kyker-Snowman 2002). There are several advantages of girdling: it can be done year round, does not disrupt the soil, and does not adversely affect wetlands (Converse 2002). It is not expected that plants will become established to the size that would require girdling as a means of control.

Mowing

Mowing has been found to be an effective control method for several populations of invasive species. Weekly mowing has been found to be effective for Asiatic bittersweet, however less frequent mowing (e.g., two to three times per year) has been found to stimulate root suckering (Dreyer 2002). Also, mowing three to six times per growing season for two to four years has been found to be effective at controlling multiflora rose (Plant Conservation Alliance 2000). For Russian olive, mowing and brush removal has been an effective control method (Plant Conservation Alliance 2000).

Cutting

For larger populations of invasive species (e.g., all species), eradication can be achieved via cutting and removal of seed heads, prior to herbicide application. Cutting will be done close to the ground, and all plant parts will be disposed of in an approved offsite location. In particular, seed heads and/or fruits will be bagged prior to removal to prevent unnecessary spread of reproductive materials. For populations of Asiatic bittersweet (Plant Conservation Alliance 2000), Russian olive (Sather and Eckardt 2002), purple loosestrife (Tu 2000), and common reed (Tu 2000 and Martin 2001) cutting and herbicide application will be focused around the fall

When plants are actively translocating nutrients to their roots. For the buckthorns, cutting and herbicide application should be done in spring and fall to be most effective (Converse 2002). For other invasive species, the timing of cutting and herbicide application was not specifically noted.

2.4 CHEMICAL CONTROL AND ERADICATION METHODS

Herbicides

Herbicides may be used alone or in conjunction with cutting of invasive plant stems. Using a backpack-type sprayer, foliar or spot application of herbicides may be used for larger infestations or for when the entire root system cannot be removed using the grubbing method. Herbicides approved for use in wetland environments, such as glyphosate (*Rodeo*), may be applied to eliminate re-sprouting. Foliar application of glyphosate has been found to be effective in eradicating small populations of Russian olive (Sather and Eckardt 2002). Biannual (summer and fall) application of herbicides has been found to be effective in eradicating purple loosestrife (Plant Conservation Alliance 2000) and buckthorn (Converse 2002) populations. The stem-cutting and herbicide (*i.e.*, glyphosate) application has been found effective for all populations of invasive species found along the ROW except one, Asiatic bittersweet. For all other species, glyphosate is an effective herbicide. Cut stems or remaining roots are hand painted or sprayed with herbicide to prevent regrowth. Special care shall be taken when using herbicides to avoid overspray or application to adjacent native species.

3.0 LITERATURE CITED

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**Sparrows Point Project
Exotic and Invasive Species Control Plan
Mid Atlantic Express Pipeline
August 2008**

**EXOTIC AND INVASIVE SPECIES CONTROL PLAN
FOR WETLANDS ALONG THE PIPELINE ROUTE**

**AES MID-ATLANTIC EXPRESS PIPELINE
AUGUST 2008**

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EXOTIC AND INVASIVE SPECIES CONTROL PLAN FOR WETLANDS ALONG THE PIPELINE ROUTE

INTRODUCTION:

The intention of this control plan is to provide awareness of the issue and foster early detection so land managers can implement management actions to prevent exotic and invasive species from becoming established and/or spreading. The measures outlined in this plan are intended to supplement the restoration and maintenance measures described in the AES Environmental Construction Plan.

CONTROL STRATEGY:

The construction process may provide exposed topsoil for potential recruitment of exotic and invasive species and the potential exists for equipment to introduce exotic and invasive species. In order to mitigate this potential introduction, AES will implement an exotic and invasive species control strategy involving a three step process:

- The first is to identify exotic and invasive species infestations during pre-construction flagging of the delineated wetlands. If infestations are identified, AES will segregate the vegetative material and infested topsoil for disposal off site.
- The second is to minimize introduction of exotic and invasive species. AES will require the contractor to wash equipment before introduction to the construction area for the first time. Water and materials captured from the washing will be contained on site and be properly disposed off site. During construction, AES will use construction techniques that minimize the time that bare soil is exposed and, therefore, minimize the opportunity for exotic species to become established. In addition, AES will follow the FERC Wetland and Waterbody Construction and Mitigation Procedures, which include segregation of topsoil from the trench and immediately restoring the topsoil back to its original location once backfilling the trench is complete, if the area is not inundated or soils are saturated. This will maintain the native plant seed bank. AES will sow a cover crop, using a native wetland seed mix, along all exposed soil surfaces within a short time from completing construction to assure that a suitable growing substrate for exotic or invasive species is not available for long periods of time.
- The third and final is to monitor the wetlands for invasive species. The wetlands will be monitored for a period of 3 years to allow for early detection and eradication of exotic and invasive species. If exotic or invasive species are found in areas not previously identified and in numbers that are substantially higher from the surrounding undisturbed areas, AES will conduct spot control activities eradication. Control activities will involve hand removal and/or application of herbicides of infestations.

METHODS FOR ERADICATION:

In areas where exotic or invasive species are found in areas not previously identified and in numbers that are substantially higher from the surrounding undisturbed areas, AES will utilize eradication methods. Methods used to eradicate exotic and invasive species found in wetlands

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following restoration of the right-of-way (ROW) will include a two-phased approach including physical methods (e.g., grubbing, girdling, mowing or cutting) and/or chemical methods (e.g., application of herbicides) as necessary.

The uprooted plant materials shall then be bagged and disposed of in an appropriate container or approved offsite location to prevent re-introduction into the wetland

Herbicides approved for use in wetlands may be used alone or in conjunction with cutting of invasive plant stems. Using a backpack-type sprayer, foliar or spot application of herbicides may be used for larger infestations or for when the entire root system cannot be removed using the grubbing method.