

DAMAGE ASSESSMENT AND RESTORATION PLAN FOR THE KINDER MORGAN TERMINALS SOUTH HILL TERMINAL IN CHESAPEAKE, VIRGINIA

JUNE 2017



PREPARED BY:



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Note to Reader:

Following is the final Damage Assessment and Restoration Plan (DARP) for the Kinder Morgan Terminals South Hill Terminal jet fuel release that occurred on January 22, 2016.

Executive Summary:

This DARP has been prepared by commonwealth and federal natural resource trustees to address natural resources and services injured or lost due to the release of oil at or from the South Hill Terminal owned and operated by Kinder Morgan Terminals, located in Chesapeake, Virginia. The designated natural resource trustee agencies involved in the development of this document are the U.S. Department of the Interior (DOI) represented by the U.S. Fish and Wildlife Service (USFWS) and the Commonwealth of Virginia represented by the Virginia Department of Environmental Quality (VDEQ), collectively, the Trustees.

The South Hill Terminal is located at 502 Hill Street in Chesapeake, Virginia (Facility). The Facility is located adjacent to the Elizabeth River and has a footprint of 106 acres. The Facility contains 38 storage tanks ranging in capacity from 142 to 120,000 barrels. Commodities stored in these tanks include petroleum, liquid fertilizers, and specialty chemicals.

On January 22, 2016 the Facility reported the release of 75,222 gallons of jet fuel A into the secondary containment surrounding Tank No. 6. The release was the result of the transfer of fuel to the incorrect tank which resulted in the over-filling of Tank No. 6. The Trustees determined that this release posed a direct threat to natural resources for which the federal and/or commonwealth governments may assert trusteeship under the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. § 9601 *et seq.*; the Clean Water Act, 33 U.S.C. § 1321 *et seq.*; and the Oil Pollution Act, 33 U.S.C. § 2701 *et seq.* The natural resources affected by the release at or from the Facility include migratory avian species.

For the Facility, the Trustees identified Kinder Morgan Terminals as the responsible party for the release of oil and corresponding natural resource damages. To facilitate the settlement and achieve a cost-effective resolution, the Trustees invited Kinder Morgan Terminals to conduct a cooperative assessment. The Trustees and Kinder Morgan Terminals reviewed site-specific data and evaluated a reasonable range of restoration alternatives to compensate for injuries to natural resources and lost services. The overall objective of the restoration planning process is to identify restoration alternatives that are appropriate to restore, rehabilitate, replace, or acquire natural resources and their services equivalent to natural resources injured or lost as a result of the release. The purpose of restoration is to make the public whole by providing compensation for injuries and losses to natural resources. Based on a thorough evaluation, the

Trustees concluded that the rehabilitation of waterfowl impoundments at USFWS's Back Bay National Wildlife Refuge (BBNWR) is the most appropriate restoration option for the natural resource injured and services lost. BBNWR, located in the same flyway as the Facility, provides critical feeding and resting habitat for migratory and wintering birds and is in need of habitat restoration to include dike stabilization, water control structure improvements, woody vegetation removal and submerged aquatic vegetation restoration. This rehabilitation of waterfowl impoundments at BBNWR was selected as the preferred restoration alternative. The Trustees and Kinder Morgan Terminals agreed on settlement terms for natural resource damages and all Trustee costs in December of 2016.

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DAMAGE ASSESSMENT AND RESTORATION PLAN FOR THE KINDER MORGAN TERMINALS SOUTH HILL TERMINAL IN CHESAPEAKE, VIRGINIA

1 INTRODUCTION AND INCIDENT SUMMARY

This Damage Assessment and Restoration Plan (DARP) has been prepared by the Natural Resource Trustees to address natural resources and services injured or lost as a result of the discharge of an estimated 75,222 gallons of jet fuel A at the Kinder Morgan Terminals South Hill Terminal located at 502 Hill Street in Chesapeake, Virginia on January 22, 2016. The designated natural resource trustee agencies involved in the development of this document are the U.S. Department of the Interior (DOI) represented by the U.S. Fish and Wildlife Service (USFWS) and the Commonwealth of Virginia represented by the Virginia Department of Environmental Quality (VDEQ) (collectively, the Trustees). The Trustees are responsible under state and/or federal law to assess, recover, and seek compensation for natural resources injured and/or services lost as the result of unauthorized discharges of oil and or release of hazardous substances to the environment.

This DARP is intended to inform members of the public on the Trustees' assessment of the natural resource injuries and service losses described herein and the restoration actions that will be undertaken to compensate the public for those injuries and losses. The draft DARP was made available March 19, 2017 for public review and comment for 30 days. No public comments were received.

1.1 Overview of the Incident

On January 22, 2016 the Kinder Morgan Terminals South Hill Terminal (Figure 1) located at 502 Hill Street in Chesapeake, Virginia (Facility) reported the release of 75,222 of jet fuel A into the secondary containment surrounding Tank No. 6. The release was the result of the transfer of fuel to the incorrect tank which resulted in the over-filling of Tank No. 6. All of the released product was contained in the secondary containment but on the night of January 22 an estimated 75 migratory birds, primarily Canada geese (*Branta canadensis*), landed in the secondary containment area and became oiled. On January 23, 2016, recovery operations were initiated by volunteers from the Virginia Beach Society for Prevention of Cruelty to Animals (SPCA) to recover and rehabilitate the oiled birds.

The response actions did not contemplate or provide for the restoration of injuries to natural resources. Based upon site visits and personal observations the Trustees determined actual or potential injuries to natural resources and services occurred. Therefore, restoration planning is necessary since injuries resulted from the release.



Figure 1. Kinder Morgan Terminals South Hill Terminal.

1.2 Natural Resources Injuries

Restoration planning is needed to evaluate the magnitude of actual and potential injuries to natural resources and natural resource services and to use that information to determine the need for, and scale of, restoration actions. Natural resource services are the ecological and public services that natural resources provide, such as foraging and nesting habitat for bird populations, structural and ecological habitat for aquatic invertebrates, or fishing, hiking, swimming, nature photography, or similar recreational or educational services. Restoration planning provides the link between the injury and the restoration and has two basic components: injury assessment and restoration selection.

The goal of injury assessment is to determine the nature and extent of injuries to natural resources and services, thereby providing a factual basis for evaluating the need for, type of, and scale of restoration actions. Consistent with the Oil Pollution Act of 1990 (OPA, 33 U.S.C. §2701 *et seq.*), the goal of the restoration actions presented in this DARP is to make the environment and the public whole for injuries to, or lost use of, natural resources and services

resulting from the release. This will be accomplished through the restoration, rehabilitation, replacement, or acquisition, collectively referred to as restoration, of equivalent natural resources and services. The specific goals for this action are to restore the following natural resources affected by the spill: migratory birds.

1.3 Natural Resource Trustees and Authority

This DARP has been prepared jointly by the USFWS and VDEQ. Each of these agencies is a designated Natural Resource Trustee pursuant to the OPA (33 U.S.C. §2706), and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP, 40 CFR §§300.600 and 300.605), for natural resources injured by the release. As a designated Trustee, each agency is authorized to act on behalf of the public under state and/or federal law to assess and recover natural resource damages and to plan and implement actions to restore natural resources and resource services injured or lost as the result of a discharge of oil. Applicable laws and regulations regarding natural resources damage assessment and restoration planning include:

- OPA of 1990 (33 U.S.C. §2701 *et seq.*)
- Natural Resource Damage Assessment Regulations under OPA (15 CFR Part 990)
- NCP (40 CFR Part 300, Subpart G)
- National Environmental Policy Act (NEPA, 42 U.S.C. §4321 *et seq.*)

1.3.1 Overview of OPA Requirements

OPA establishes a liability regime for oil spills that injure or are likely to injure natural resources and/or the services that those resources provide to the ecosystem or humans. Federal and state agencies and Indian tribes act as Trustees on behalf of the public to assess the injuries, scale restoration to compensate for those injuries and implement restoration. Section 1006(e)(1) of OPA (33 U.S.C. §2706(e)(1)) requires the President, acting through the Under Secretary of Commerce for the National Oceanic and Atmospheric Administration, to promulgate regulations for the assessment of natural resource damages resulting from a discharge or substantial threat of a discharge of oil. Assessments are intended to provide the basis for restoring, replacing, rehabilitating, and acquiring the equivalent of injured natural resources and services. The process emphasizes both public involvement and participation by the responsible party or parties.

Under OPA (33 U.S.C. §2706(d)), Trustees can recover:

- 1) the cost of restoring, rehabilitating, replacing, or acquiring the equivalent of the damaged natural resources (“primary restoration”);
- 2) the diminution in value of those injured natural resources pending restoration (“compensatory restoration”); and
- 3) the reasonable assessment costs.

Incident, oil, and natural resources are defined under OPA (33 U.S.C. §2701):

- Incident means “any occurrence or series of occurrences having the same origin, involving one or more vessels, facilities, or any combination thereof, resulting in the discharge or substantial threat of discharge of oil.”
- Oil means “oil of any kind or in any form, including petroleum, fuel oil, sludge, oil refuse, and oil mixed with wastes other than dredged spoil, but does not include any substance which is specifically listed or designated as a hazardous substance under

Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. 9601).”

- Natural resources are “land, fish, wildlife, biota, air, water, groundwater, drinking water supplies, and other such resources belonging to, managed by, held in trust by, appertaining to, or otherwise controlled by the United States, any State or local government or Indian tribe.”

1.3.2 Natural Resource Damage Assessment Regulations under OPA

As described in the OPA regulations, a natural resource damage assessment (NRDA) consists of three phases: (1) Preassessment, (2) Restoration Planning, and (3) Restoration Implementation. Based on early available information collected during the preassessment phase, the Trustees make a preliminary determination as to whether natural resources and/or services have been injured and/or are likely to be injured by the release. Through coordination with response agencies (e.g., for this case the VDEQ), the Trustees next determine whether the oil spill response actions will eliminate the injury or the threat of injury to natural resources. If injuries are expected to continue and feasible restoration alternatives exist to address such injuries, the Trustees may proceed with the restoration planning phase. Restoration planning also may be necessary if injuries are not expected to endure but are nevertheless suspected to have resulted in interim losses of natural resources and/or services from the date of the incident until the date of recovery.

Before initiating a NRDA, the Trustees must determine that (15 CFR §990.41):

- an incident has occurred;
- the incident is not from a public vessel;
- the incident is not from an onshore facility subject to the Trans-Alaska Pipeline Authority Act;
- the incident is not permitted under federal, state, or local law; and
- public trust natural resources and/or services may have been injured as a result of the incident.

Injury is defined in the regulations as “an observable or measurable adverse change in a natural resource or impairment of a natural resource service” (15 CFR §990.30).

The purpose of the restoration planning phase is to evaluate the potential injuries to natural resources and services and use that information to determine the need for and scale of associated restoration actions. This phase provides the link between injury and restoration and has two basic components: (1) injury assessment, and (2) restoration selection. The goal of injury assessment is to determine the nature and extent of injuries to natural resources and services, thus providing a factual basis for evaluating the need for, type of, and scale of restoration actions. As the injury assessment is being completed, the Trustees develop a plan for restoring the injured natural resources and services.

During the restoration planning phase, the Trustees must:

- identify a reasonable range of restoration alternatives,
- evaluate and select the preferred alternative(s),
- develop a draft Restoration Plan presenting the alternative(s) to the public,
- solicit public comment on the draft Restoration Plan, and

- incorporate public comments into a Final Restoration Plan.

1.3.3 NCP

The NCP is the federal government's blueprint for responding to both oil spills and hazardous substance releases. The NCP is the result of the federal government's efforts to develop a national response capability and promote overall coordination among the hierarchy of responders and contingency plans. Federal agencies are designated as Natural Resource Trustees according to the regulations in 40 CFR Part 300, Subpart G.

1.3.4 NEPA Compliance

NEPA requires an assessment of any federal action that may impact the environment. NEPA applies to restoration actions undertaken by federal Trustees, except where a categorical exclusion or other exception to NEPA applies. Restoration of natural resources under OPA which involves Federal Trustee agencies must comply with NEPA (42 U.S.C. §4321 *et seq.*) and the Council on Environmental Quality (CEQ) regulations implementing NEPA at 40 CFR Part 1500. The process outlined in OPA for NRDA selection of restoration alternatives is substantially similar to NEPA and therefore is in compliance with NEPA and the CEQ regulations. This DARP summarizes the current environmental setting, describes the purpose and need for action, identifies alternative actions, assesses their applicability and environmental consequences, and summarizes Trustee actions taken to facilitate opportunities for public participation in the decision-making process. Based on the previous information the Trustees determined that as proposed, the preferred restoration alternative and proposed restoration project meet the criteria for Categorical Exclusion from further environmental assessment or environmental impact statement evaluation as provided by the DOI Revised NEPA Implementation Procedures (DOI 1996).

1.3.5 Coordination and Settlement with the Responsible Party

Federal regulations direct the Trustees to invite the potential responsible party (PRP) to participate in the damage assessment and restoration process. Although the PRP may contribute to the process in many ways, final authority to make determinations regarding injury and restoration rests solely with the Trustees.

Kinder Morgan Terminals agreed with the Trustees to perform a cooperative restoration-based assessment to address potential or actual natural resource injuries and lost services at the Facility. During the assessment phase the types of resources affected by the spill were quantified. Appropriate scientific methodologies were used to determine the nature and extent of natural resource injuries.

1.3.6 Public Participation

Public review of the Draft DARP is an integral component of the restoration planning process. Through the public review process, the Trustees seek public comment on the methods used to define and quantify natural resource injuries and service losses and the proposal to restore injured natural resources or replace lost resource services. The Draft DARP was available for public review and comment for a period of 30 days to provide the public with information about the nature and extent of the natural resource injuries identified and restoration alternatives evaluated and proposed for implementation. A notice of availability was posted in the Virginian

Pilot and copies of the Draft DARP were available online at:
<https://www.fws.gov/northeast/virginiafield/news/news.html>

As restoration progresses, the Trustees may amend the DARP if significant changes are made to the types, scope, or impact of the project. In the event of a significant modification to the DARP, the Trustees will provide the public with an opportunity to comment on that particular amendment.

An administrative record consisting of a catalog of all documents Trustees used to develop and make decisions related to the NRDAR process, including the DARP, is maintained by USFWS at the Virginia Ecological Services Office in Gloucester, VA.

2 AFFECTED ENVIRONMENT

This section describes the toxicity profile of the material spilled, the description of injured resources and services, as well as federal and state endangered and/or threatened species potentially affected by the jet fuel A spill. The description of these resources focuses primarily on the natural resources and services that are relevant to the discussion of injuries and restoration projects presented in this document.

2.1 Jet Fuel A Toxicity Profile

The product discharged from the Facility was jet fuel A, a kerosene-type fuel used in aviation turbine engines regulated under OPA. The classification “jet fuel” is applied to fuels meeting the required properties for use in jet engines and aviation turbine engines. In general, jet fuels are highly refined kerosene products, blended from low sulfur or desulfured kerosene and various light distillates generated from hydro-cracking partially refined petroleum feed-stocks. The end product must meet critical specifications, including a very low freezing point or pour point, smoke point and aromatic hydrocarbon content, generally less than 20% (Irwin et al. 1997).

In terms of refining crude oil, jet fuel A contains paraffins (alkanes), cycloparaffins (cycloalkanes), aromatics, and olefins. Aromatic compounds of concern include alkylbenzenes, toluene, naphthalenes, and polycyclic aromatic hydrocarbons (PAHs).

As intermediate products, jet fuels have a combination of (mostly) lighter, less persistent and more mobile compounds as well as (some) heavier, more persistent and less mobile compounds. These two different groups are associated with two distinctly different patterns of fate/pathway concerns:

1. The relatively lighter, more volatile, mobile, and water soluble compounds in jet fuel A tend to fairly quickly evaporate into the atmosphere or migrate to groundwater. Benzenes, toluene, and xylenes (all common components of jet fuels) have high volatility. When exposed to oxygen and sunlight, most of these compounds tend to break down relatively quickly. However, in groundwater, many of these compounds tend to be more persistent than in surface water, and readily partition on an equilibria basis back and forth between water and solids (soil and sediment) media.
2. The compounds in jet fuel that tend to be somewhat more persistent and more bound to solids particles include the PAHs, alkyl PAHs, and alkyl benzenes. Higher concentrations

of heavier PAHs tend to be in adjacent contaminated soils rather than groundwater (Irwin et al. 1997).

The toxicological effects of jet fuel A may also be evaluated through its constituents, such as PAHs, and other semi-volatile and volatile components (Irwin et al. 1997). In general, jet fuels are moderately volatile and soluble and possess a moderate to highly acute toxicity to biota. Product-specific toxicity is related to the type and concentration of aromatic compounds. Short-term hazards to biota by the lighter, more volatile, and water soluble compounds (such as benzene compounds and toluene) in jet fuel A include potential acute toxicity to aquatic life in the water column (especially in relatively confined areas) as well as potential inhalation hazards. Impacts to birds, mammals, or other biota which come into direct contact with spilled product represent another potential short-term hazard (Irwin et al. 1997).

2.2 Description of Injured Resources and Services

Based on field observations, the Trustees determined that migratory birds were injured due to the release of jet fuel A from the Facility.

2.3 Biological Resources

Three species of migratory birds were affected through direct contact with the jet fuel A release at the Facility: Canada geese (*Branta canadensis*), mallards (*Anas platyrhynchos*), and American black ducks (*Anas rubripes*). No other biological resources were impacted because all of the released fuel was contained within the secondary containment area.

2.4 Injury and Service Losses Due to Response Actions

Response actions focus on controlling exposure to released hazardous substances or crude oil products, by removing, neutralizing, or isolating them in order to protect human health and the environment from the threat of harm. Response actions are separate and distinct from the damage assessment process. However, at times, response actions can cause additional injuries to natural resources. When such injuries result from response actions, the additional injuries are included in the damage assessment (15 CFR §990.51).

During the response to the jet fuel A spill the product was contained and recovered from the secondary containment area. No measures were initiated on the night of January 22, 2016 such as hazing to prevent migratory birds from landing within this area. The Trustees therefore have reason to believe that the response actions undertaken during the event did not prevent, remedy, or compensate for potential injuries to or losses of natural resources under their jurisdiction. The Trustees have concluded that a compensable injury resulted from the spill and response actions taken.

2.5 Endangered and Threatened Species

The federal Endangered Species Act (ESA) of 1973 (16 USC Section §1531 *et seq.*) directs the Trustees to protect and conserve listed endangered and threatened species. The Northern long-eared bat (*Myotis septentrionalis*), federally listed threatened, is the only federally listed species known to occur in the City of Chesapeake. There is no federally designated critical habitat for this species.

2.6 Human and Cultural Environment

The Facility is located in an industrial area within the City of Chesapeake. The release and response actions to recover the spilled fuel were all contained within the footprint of the Facility. Oiled birds were recovered immediately adjacent to the Facility by individuals walking the perimeter of the Facility and picking up oiled birds and taking them to a staging area immediately outside the entrance to the Facility to be transported to the Virginia Beach SPCA for rehabilitation.

3 INJURY AND SERVICE LOSS EVALUATION

This section describes the potential injuries and quantifies the potential ecological service losses caused by the incident and subsequent response actions. It begins with an overview of the Trustees' preassessment evaluation, assessment strategy, and restoration planning. The remainder of the section presents the results of Trustee assessments for the specific resources affected by the spill of jet fuel A, including the approaches used to determine potential or actual injuries and quantify service losses.

3.1 Preassessment Evaluation

The preassessment phase is the initial step undertaken by the Trustees as part of the NRDA process at an oil spill. During the preassessment phase, trustees collect the necessary information to make critical determinations that shape the remainder of the NRDA. The preassessment is based on the circumstances of a given incident and helps the trustees determine whether NRDA actions under OPA are justified and make the necessary preliminary determinations regarding the type of injury assessment and restoration actions that may be pursued. The preassessment serves to document the Trustees decision process as well as coordinating other matters that may be considered during the preassessment phase including data collection, establishing an AR, coordination, and emergency restoration.

The preassessment phase as described in the NRDA regulations pursuant to OPA has three threshold requirements that must be met during the preassessment phase before restoration planning can proceed. It must be concluded that:

1. a release of oil has occurred as defined by OPA § 990.30,
2. the release was not a permitted action, and
3. natural resources under trusteeship may have been or may be injured as a result of the incident.

The Trustees must also make the further determination to conduct restoration planning. OPA requires the Trustees to address the following criteria in making a determination to conduct restoration planning:

1. Injuries to natural resources that the Trustees have trusteeship over are likely to or have been injured.
2. Response actions taken have not or are not expected to compensate for natural resource injuries.
3. Primary or compensatory restoration actions are feasible.

The Trustees made an early decision to conduct a preassessment to determine if a NRDA was necessary. Immediately after the spill, during response activities, Trustee agencies had representatives at the Facility. The information collected during the preassessment phase for the

spill satisfies the three criteria listed above and confirms the need for restoration planning to address injuries to natural resources as a result of the spill. In accordance with 15 CFR §990.42, the Trustees determined in February 2016 that the requisite conditions existed to justify proceeding with a NRDA and restoration planning beyond the preassessment phase. These conditions, discussed in more detail below, include: existence of natural resource injuries resulting from the discharge or from associated response actions; response actions were inadequate or inapplicable to restoration of natural resource injuries and losses; and existence of feasible actions to address the injured resources.

3.2 Assessment Strategy

The Trustees conducted inspections of the Facility to document natural resource injuries and recovery at the site. Information gathered during these inspections allowed the Trustees to quantify the percent reduction in ecological services provided by the impacted ecological communities. The Trustees also quantified the resources provided by the restoration alternatives evaluated. The scale (or size) of the restoration action should be that which provides the value to adequately offset the value of the losses. The process of determining the size of restoration is called restoration scaling. Restoration scaling requires a framework for quantifying the value of losses and for quantifying the benefits of restoration so the losses and benefits can be compared.

3.3 Quantification of Injury

To support their injury determination, the Trustees assessed injury based on physical, chemical, or biological adverse changes in a resource resulting from exposure to jet fuel A. Examples of these injuries include changes in an organism's physical development, health, reproductive success, or behavior. The two major pathways of exposure for birds are oiling of feathers and ingestion (NRC 2003). When feathers are oiled, birds lose their water-repellency, leading to loss of buoyancy and ability to regulate heat (Fry and Lowenstine 1985, Wiens 1995) which comprises their ability to dive, fly, or feed, and may lead to death by starvation, drowning, or hypothermia (Wiens 1995). Birds can ingest oil during preening or ingestion of oil adhered to food items with subsequent effects of anemia, immunosuppression, pneumonia, intestinal irritation, kidney damage, altered blood chemistry, impaired osmoregulation, decreased growth, decreased production and egg viability, and abnormal conditions in the lungs, adrenals, liver, nasal salt gland, and fat and muscle tissue (Fry and Addiego 1987, NRC 2003, TWC 2007).

Seventy-five birds (primarily Canada geese) were injured by the release. The number of birds retrieved after an oil spill represents only a fraction of the actual number of birds affected by the spill. Oiled and dead birds are not recovered because they hide, sink, drift out to sea, are scavenged, or are overlooked by search teams (Burger 1993; Sperduto et al. 1998; 2003). To estimate the actual mortality resulting from this incident, the Trustees considered the three methods presented by the Bird and Wildlife Technical Working Group (TWG) for the *M/T Athos I* oil spill NRDA case as Canada goose accounted for a large number of impacted birds during this spill. One of the more common approaches is to use a multiplier where data from the oiled and dead bird recovery effort is multiplied by a conversion factor to arrive at an estimate of the total bird mortality. The TWG also considered developing a computer model using the trajectory of the oil, the spatial distribution of birds, and probability functions to predict the number of oiled birds. The risk-based assessment approach uses bird recovery data and field data collected during the spill to estimate bird populations at risk and the percent of the population oiled, and data from the literature are used to estimate total mortality. Life history and behavior of different

groups of birds are considered. This approach is more time consuming and costly, but can yield less uncertainty.

To expedite the assessment and minimize costs, and with the full cooperation of the responsible party, the Trustees considered direct mortality as injury and indirect injury in terms of production foregone due to the loss of future generations and chose the multiplier approach. Using 4.33 as the multiplier, the 75 birds that were injured translates into 325 birds owed. Dividing this number in half to determine mating pairs yields 163 pairs. Conducting a literature search on required habitat for nesting Canada geese yielded a value of 0.5 to 1 acre per mating pair in the wild (Johnson 1947). Using the lower requirement, a value of 82 acres was calculated. A more recent study of urban Canada geese populations (Smith et al. 1999) determined that habitat requirements are much less than for wild populations. Based on this study, the Trustees assumed that urban populations would require 15 to 20% of the habitat that wild populations would need for propagation. Consequently, the Trustees calculated values ranging from 12 to 16 acres of constructed wetland habitat. However for settlement purposes and in light of Kinder Morgan's approach to overseeing the care of injured birds this value was rounded down to 10 acres.

4 GENERAL RESTORATION ALTERNATIVES

The goal of OPA is to make the environment and public whole for injuries to natural resources and services resulting from an incident involving the discharge or substantial threat of a discharge of oil. OPA recommends that this goal be achieved by returning injured natural resources to their baseline condition and by compensating for any interim losses of natural resources and services that occur during the period of recovery to baseline or pre-spill condition. The overall objective of the restoration planning process is to identify restoration alternatives that are appropriate to restore, rehabilitate, replace, or acquire natural resources and their services equivalent to natural resources injured or lost as a result of discharges of oil. The restoration planning process has two components: primary restoration and compensatory restoration. Primary restoration actions are actions designed to return resources and services to their baseline levels on a natural recovery (no action) or accelerated (active restoration actions) time frame. Compensatory restoration is any action taken to compensate for interim losses of natural resources and services, pending return of the resources and their services to baseline level.

In accordance with NRDA regulations, the Trustees developed appropriate restoration alternatives and selected preferred alternatives to address resource injuries and losses of services. The Trustees first identified and evaluated general alternatives capable of serving as compensatory restoration for the injured natural resources and/or services. As part of the effort to develop general restoration alternatives, the Trustees consulted with local scientists and state agency personnel to obtain their perspective on the benefits and feasibility of various types of restoration alternatives. These efforts were important in assisting the Trustees in identifying projects that are potentially feasible, have strong net environmental benefits, and meet restoration requirements to compensate for injuries resulting from the spill.

Some compensatory alternatives considered by the Trustees would provide similar resources and/or services to those injured, while other alternatives would compensate by providing a comparable resource enhancement or preservation. The Trustees preferentially seek to restore injured natural resources in-kind (e.g., create nesting habitat to compensate for lost migratory

bird function), in the geographical vicinity affected, while working to maximize ecosystem benefit, benefit to human uses of the environment, and cost-effectiveness of restoration as a whole. However, in-kind restoration is not always possible or feasible, or may not otherwise fit the restoration selection criteria, and in those instances, enhancement or acquisition of alternative resources that provide similar ecological benefits may be appropriate. Finally, increased benefits and improved cost-effectiveness may often be obtained by addressing several injured resources and/or services or classes of injury with a single restoration project.

4.1 Evaluation Criteria for Selecting Preferred Restoration Alternatives

Once a reasonable range of restoration alternatives is developed, the OPA NRDA regulations (15 CFR §990.54) require the Trustees to identify preferred restoration alternatives based on certain criteria. The Trustees used the evaluation criteria listed below to consider and prioritize all restoration project alternatives currently identified. The criteria are not ranked in order of priority:

The cost to carry out the alternative: The benefits of a project relative to its cost are a major factor in evaluating restoration alternatives. In addition, the Trustees consider the total cost of the project. Factors that can affect and increase the costs of implementing the restoration alternatives may include project timing, access to the project site (for example with heavy equipment), obtaining state or federal permits, acquiring the land needed to complete a project, and potential liability from project construction.

The extent to which each alternative is expected to meet the Trustees' goals and objectives in returning the injured natural resource and services to baseline and/or compensating for interim losses: The fundamental goal of any compensatory restoration project is to provide resources and services of the same quality that were lost. Thus, the ability of the restoration project to provide comparable resources and services is an important consideration in the project selection process. Projects that restore, rehabilitate, replace, enhance, or acquire the equivalent of the resources and services injured by the spill are preferred to projects that benefit other comparable resources or services. To quantify the provision of resources and services, the Trustees must consider the potential relative productivity of the restored habitat. Finally, future site management issues and the opportunity for conservation easements are also considered because they can influence the extent that the project meets objectives. The proposed alternative must comply with all applicable federal or state laws and regulations.

The likelihood of success of each alternative: The Trustees consider technical factors that represent either risk to the success of project construction or the long-term viability of the resources and services involved. For example, project sites with high subsidence rates are problematic due to concerns about the long-term existence of constructed habitats. An alternative that is susceptible to future degradation or loss through contaminant releases or erosion is considered less viable. Sites that require long-term maintenance of project features are less feasible. A proven track record demonstrating success of projects utilizing a similar or identical restoration technique can be used to satisfy these evaluation criteria.

The extent to which each alternative will prevent future injury as a result of the incident and avoid collateral injury as a result of implementing the alternative: Alternatives should

avoid or minimize adverse impacts to the environment and the associated natural resources. Projects should not contaminate the surrounding area or conflict with the viability of endangered species populations. Projects should be compatible with surrounding land use.

The extent to which each alternative benefits more than one natural resource and/or service: This concept is related to the interrelationships among natural resources and between natural resources and the services they provide. Projects that provide benefits to more than one resource and/or service yield more benefits.

The effect of each alternative on public health and safety: Projects that would negatively affect public health or safety are not appropriate.

The regulations allow the Trustees to prioritize these criteria, and to use additional criteria as appropriate. The key criterion for the Trustees are the extent to which an alternative will compensate for losses and the likelihood of its success as these criterion most clearly indicate whether the goal of making the public whole from losses resulting from the discharge is met.

4.2 Compensatory Restoration Alternatives

As previously discussed and in accordance with the OPA regulations, the Trustees developed a reasonable range of restoration alternatives to address resource injuries and losses of service. Primary restoration under natural attenuation was not appropriate. The injuries considered for compensatory restoration consisted of the interim lost services associated with migratory birds. During the compensatory restoration planning, the Trustees evaluated what actions, if any, were appropriate to replace equivalent ecological services lost due to exposure to oil as a result of the spill. Some compensatory alternatives considered by the Trustees would provide similar resources and/or services to those injured, while other alternatives would compensate by providing a comparable resource or service.

4.2.1 General Alternatives Considered

The following subsections discuss a range of possible alternatives for restoration, an evaluation of each alternative as compared to the selection criteria shown above, and describe the alternative selected by the Trustees for implementation.

Alternative 1 - No action

The Trustees evaluated the No Action alternative, which would provide no compensation beyond natural attenuation for injuries at the site. Under this alternative, the Trustees would take no direct action to obtain compensation for interim losses, pending recovery, associated with the injured resource and/or lost service in question. This alternative would be appropriate where no significant interim losses were incurred as a result of the oil spill at the Facility, or where actions to provide compensation for those losses are not cost-effective.

The principal advantages of this approach are the ease of implementation and the absence of monetary costs. The Trustees may select natural recovery under three conditions: (1) if feasible, (2) if cost-effective primary restoration is not available, or (3) if injured resources would recover quickly to baseline without human intervention. The No Action alternative is not appropriate for the spill because the Trustees have determined that there were significant interim losses of

natural resource services and that the No Action alternative would not provide compensation for lost use of natural resources and services. Further, it is inconsistent with OPA because interim ecological service losses have occurred and the public and the environment would not be made whole (compensated) through this alternative and cost-effective methods to achieve compensation are available. The Trustees have not selected the No Action alternative as the preferred restoration alternative.

Alternative 2 - Creation of habitat

This alternative would involve the creation of nesting habitat (wetland) to offset the injuries to the migratory birds affected by the incident. The creation of wetland habitat in the form of freshwater open water/wetland habitat is technically feasible. However, this process requires re-contouring existing habitats to the correct hydrology for wetland inundation and providing connection to existing freshwater waterbodies. Vegetation of the wetland areas would be accomplished by planting native species and eliminating invasive species. The habitat would be monitored for sustained growth of native species dependent upon an aquatic habitat.

This alternative while technically feasible and meeting the OPA criteria is a very costly process with varying levels of success. It is generally recognized that constructed wetlands never fully reach the productivity levels of natural wetlands, thus requiring additional acreage to offset lost services. Due to the difficulty of constructing these different types of habitats and the reduced probability of success this alternative is not selected as the preferred restoration alternative.

Alternative 3 - Acquisition and preservation of existing high quality habitat

This alternative would provide protection for existing nesting habitat. This alternative meets all the selection criteria described by OPA. However high quality property is not available in sufficient quantity nor at a reasonable fair market value within the area. Consequently this alternative is not selected as the preferred restoration alternative.

Alternative 4 – Enhancement of habitat

Enhancement of existing nesting habitat would create additional services to compensate for lost natural resources services from the spill. An example of this would be improvement of existing waterfowl impoundments on public lands through dike modifications and submerged vegetation restoration. Enhancement of impoundments on public lands is technically feasible and cost effective because it precludes the cost of purchasing the property. The Trustees conclude that the enhancement of existing nesting habitat on public lands would compensate the public for services lost due to the spill. Therefore, this alternative is selected as the preferred restoration alternative.

4.2.2 Preferred Restoration Alternative

The Trustees, having concluded the alternatives analysis as required by OPA, have selected Alternative 4, the enhancement of existing nesting habitat on public lands as the selected restoration alternative which meets all the selection criteria and best meets the Trustees' goals and objectives in compensating for interim losses. It is technically feasible and cost-effective to implement. In compliance with OPA, the selection of a preferred restoration alternative was finalized following public review and comment on the Draft DARP.

5 RESTORATION SCALING

Since the primary injury associated with the release of jet fuel A from the Facility was to migratory birds, restoration “credits” were scaled to freshwater wetland construction to provide nesting habitat. The Trustees evaluated restoration construction based on a functional freshwater wetland that was assumed to be approximately 2-5 feet in depth. The constructed wetland was assumed to have a 30-year life span and would provide approximately 80% of the services of a fully functioning natural wetland. Scaled to the injury, freshwater wetland construction would require a minimum of 10 acres of freshwater wetlands to offset lost resources and services.

Trustee knowledge and experience in the construction of wetlands was used to develop the cost of constructing a freshwater wetland as compensation for injuries resulting from the spill from the Facility. Costs considered to develop a per acre cost for implementation of the restoration, included the cost associated with the purchase of the land, project engineering and design, excavation, planting, and Trustee oversight. For a functional freshwater wetland, the total construction cost per acre was calculated to be approximately \$10,000.00.

6 PROPOSED RESTORATION PROJECT

In Section 4.2.2 the Trustees determined that enhancement of existing nesting habitat on public lands was the preferred restoration alternative. Based on a thorough evaluation of suitable properties in the area, the Trustees concluded that rehabilitation of waterfowl impoundments at USFWS’s Back Bay National Wildlife Refuge (BBNWR) is the most appropriate restoration option for the services injured. BBNWR is located in the same flyway as the Facility, provides critical feeding and resting habitat for migratory and wintering birds, and is in need of habitat restoration to include dike stabilization, water control structure improvements, woody vegetation removal, and submerged aquatic vegetation restoration. Therefore, the rehabilitation of waterfowl impoundments at BBNWR to include dike improvements, woody vegetation removal, and submerged aquatic vegetation restoration, was selected as the preferred restoration alternative. The Trustees determined that \$115,000.00 would be necessary to implement this action and cover past and future costs incurred by the Trustees.

7 CONCLUSION

As described above, the overall objective of the restoration process is to make the environment and public whole for injuries to natural resources and/or service losses resulting from the spill. To meet that objective, the benefits of restoration actions must be related, or have an appropriate nexus, to the natural resource injuries and losses due to the discharge of jet fuel A. The relationships that must be considered include the following:

- Equivalency of created or enhanced resources or services to those affected or potentially affected by the discharge of oil, and
- Potential for restoration at or near the area where natural resource injuries/service losses occurred.

To achieve this fundamental objective, the Trustees determined that the restoration alternative selected must have an ecological and a geographical relationship to injured resources and lost services. The Trustees approached restoration planning with the view that the injured natural resources/lost services are part of an integrated ecological system and that the selected enhancement of existing nesting habitat at BBNWR provides the most relevant ecological benefits within the geographical area targeted for restoration actions.

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Damage Assessment and Restoration Plan for the Kinder Morgan Terminals South Hill Terminal in Chesapeake, Virginia

In accordance with U.S. Department of the Interior (Department) policy regarding documentation for natural resource damage assessment and restoration projects (521 DM 3), the Authorized Official for the Department must demonstrate approval of draft and final Restoration Plans and their associated National Environmental Policy Act documentation, with concurrence from the Department's Office of the Solicitor.


The Authorized Official for the Kinder Morgan Terminals South Hill Terminal jet fuel release is the Regional Director for the U.S. Fish and Wildlife Service's Northeast Region.


The draft DARP was released March 19, 2017 for public review and comment for 30 days. No public comments were received. By the signatures below, the Damage Assessment and Restoration Plan (DARP) is hereby finalized and approved.

Approved:


Concurred:

Acting


Wendi Weber
Regional Director
Northeast Region
U.S. Fish and Wildlife Service
Date 12 July 2017


Mark Barash
Senior Attorney
Northeast Region
Office of the Solicitor
Date 6/13/2017

Approved:


Jefferson D. Reynolds
Director, Division of Enforcement
Virginia Department of Environmental Quality
Date 20 Jun 2017