

DAMAGE ASSESSMENT AND RESTORATION PLAN/ENVIRONMENTAL COMPLIANCE ANALYSIS FOR THE JANUARY 2016 DOMINION ENERGY VIRGINIA CRYSTAL CITY SUBSTATION OIL SPILL IN ARLINGTON, VIRGINIA

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PREPARED BY:

U.S. Fish and Wildlife Service

National Park Service

District of Columbia Department of Energy and Environment

Virginia Department of Environmental Quality



DAMAGE ASSESSMENT AND RESTORATION PLAN/ENVIRONMENTAL COMPLIANCE ANALYSIS FOR THE JANUARY 2016 DOMINION ENERGY VIRGINIA CRYSTAL CITY SUBSTATION OIL SPILL IN ARLINGTON, VIRGINIA

Executive Summary:

On January 24, 2016 a transformer tank rupture at the Crystal City Substation (CCS), owned and operated by Virginia Electric and Power Company d/b/a Dominion Energy Virginia¹ (DEV), resulted in the discharge of approximately 13,500 gallons of mineral oil dielectric fluid. The Crystal City Substation is located at 18th Street South and South Fern Street in Arlington County, Virginia. Abatement documents report 11,120 gallons of oil were recovered from spill containment facilities and concrete vaults that prevented product from leaving CCS property². An undetermined quantity of oil was observed off of the CCS property in the Roaches Run Waterfowl Sanctuary within the George Washington Memorial Parkway and an oil sheen was reported in the Potomac River between I-395 and the Woodrow Wilson Bridge, a distance of 7.4 miles downstream of the CCS. This discharge is referred to as the Dominion Energy Virginia Crystal City Station Oil Spill, hereinafter referred to as the DEV CCS Spill.

This Damage Assessment and Restoration Plan/Environmental Compliance Analysis (DARP/ECA) has been prepared by natural resource trustees to restore natural resources and resource services injured or lost due to the discharge of oil from the DEV CCS. This DARP/ECA is intended to inform the public about the natural resource injuries caused by the DEV CCS Spill and restoration alternatives that compensate for those injuries.

This document was prepared in accordance with the Oil Pollution Act (OPA, 33 U.S.C. §2701, et seq), the OPA Natural Resource Damage Assessment and Restoration (NRDAR) regulations (15 C.F.R. Part 990), and the System Unit Resource Protection Act (SURPA, 54 U.S.C. §§ 100721-100725), and other applicable laws and regulations.

The natural resource trustees that manage or control the natural resources and their services potentially affected by the DEV CCS Spill include the United States Department of the Interior, acting through the United States Fish and Wildlife Service and the National Park Service; the District of Columbia (DC), acting through the Department of Energy and Environment (DOEE); and the Commonwealth of Virginia, acting through the Virginia Department of Environmental Quality (collectively referred to as the “Trustees”).

Using existing information and applicable literature sources, the Trustees evaluated the nature and extent of injuries to natural resources and their services. The injuries evaluated included those to

¹ DEV is a state regulated business unit of the parent company Dominion Energy, Inc.

² An estimated additional 1,967 gallons of oil entrained in soil and gravel were also recovered from the CCS facility. The Initial Abatement Report dated February 26, 2016 and associated DEV response to DOEE’s request for additional information contains a detailed description of the spill and oil recovery.

fish communities, migratory birds in the Potomac River and adjacent shoreline areas, and lost human use of natural resources (*e.g.*, lost recreational use of a park trail). The Trustees identified and evaluated potential alternatives that would restore or replace the injured natural resources and/or their services to compensate for the losses from the DEV CCS Spill.

Injuries and Restoration Alternatives

Oil from the DEV CCS Spill injured migratory birds and their habitats. Additionally, the presence of DEV CCS Spill response activities in the Gravelly Point Parking area in George Washington Memorial Parkway resulted in lost visitor use.

The Trustees evaluated a range of restoration alternatives comprised of primary and/or compensatory restoration that address specific injuries associated with the DEV CCS Spill that may compensate the public for the injury to natural resources and the loss of resource services pending restoration. Primary actions directly restore the natural resources and services to pre-spill conditions on an accelerated timeframe compared to natural recovery. Compensatory restoration actions provide resource services to compensate the public for losses pending recovery of resources injured by the DEV CCS Spill. The Trustees have identified a preferred restoration alternative of habitat enhancement in Roaches Run Waterfowl Sanctuary along with educational signs to enhance the visitor experience and understanding of the habitat and waterfowl.

Document Summary

This DARP/ECA presents information about the DEV CCS Spill, the natural resource damage assessment and restoration, spill response, legal authorities, and public participation. Information about the estimates of exposure and/or injury to natural resources and their services caused by the DEV CCS Spill, the Trustees' identified restoration alternatives, analysis of the restoration alternatives under OPA selection criteria, and Trustees' preferred restoration alternative and associated environmental compliance analyses are presented.

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Abbreviations and Acronyms

CCS	Crystal City Substation
CWA	Clean Water Act, Federal Water Pollution Control Act (33 U.S.C. §§ 1251 <i>et seq.</i>)
DARP	Damage Assessment and Restoration Plan
DC	District of Columbia
DEV	Virginia Electric and Power Company d/b/a Dominion Energy Virginia
DOEE	DC Department of Energy and the Environment
DOI	United States Department of the Interior
ECA	Environmental Compliance Analysis
GWMP	George Washington Memorial Parkway (a National Park)
NPS	National Park Service
NRDA	Natural Resource Damage Assessment
NRDAR	Natural Resource Damage Assessment and Restoration
OPA	Oil Pollution Act (33 U.S.C. §§ 2701, <i>et seq.</i>)
PEPC	NPS Planning, Environment, and Public Comment
REA	Resource Equivalency Analysis
RRWS	Roaches Run Wildlife Sanctuary
SURPA	System Unit Resource Protection Act (54 U.S.C. §§ 100721 <i>et seq.</i>)
UC	Unified Command
USACE	United States Army Corps of Engineers
USCG	United States Coast Guard
USFWS	United States Fish and Wildlife Service
VDEQ	Virginia Department of Environmental Quality

DAMAGE ASSESSMENT AND RESTORATION PLAN/ENVIRONMENTAL COMPLIANCE ANALYSIS FOR THE JANUARY 2016 DOMINION VIRGINIA POWER CRYSTAL CITY MINERAL OIL SPILL IN ARLINGTON, VIRGINIA

1.0 INTRODUCTION

This Damage Assessment and Restoration Plan /Environmental Compliance Analysis (DARP/ECA) has been prepared by federal and state natural resource trustees with authority to restore natural resources and resource services injured or lost as a result of the discharge of mineral oil dielectric fluid at the Dominion Energy Virginia³ (DEV) Crystal City Substation (CCS) located at 18th Street South and South Fern Street in Arlington, Virginia on January 24, 2016 (herein, DEV CCS Spill). This document is part of the Restoration Planning for the DEV CCS Spill under the Oil Pollution Act (OPA). It provides details to the public including a description of the natural resource injuries and preferred restoration project to address the injuries caused by the DEV CCS Spill. The purpose of restoration is to return injured natural resources and the services they provided to the condition that would have existed had the DEV CCS Spill not occurred.

1.1 Natural Resource Damage Assessment and Restoration under the Oil Pollution Act

The primary goal of natural resource damage assessment and restoration (NRDAR) under OPA is to restore and/or replace natural resources and their services to compensate for the loss of, destruction of, or injury to natural resources and their services resulting from a discharge of oil. Under OPA, each party responsible for a vessel or facility from which oil is discharged is liable for removal costs and for damages for injury to, destruction of, loss of, or loss of use of, natural resources and their services, including the reasonable cost of assessing the injury.

Under the OPA NRDAR regulations, 15 C.F.R. Part 990, trustees may conduct a NRDAR to determine whether natural resources have been injured from a discharge of oil and plan restoration to address those injuries and loss of services. Natural resources under the jurisdiction of natural resource trustees include those that belong to, are managed by, or are otherwise controlled by, for example, the United States or any State, *see* 33 U.S.C. § 2701(20), such as land, fish, wildlife (including migratory birds) and water. Services include the functions performed by natural resources for the benefit of another natural resource or the public (15 C.F.R. § 990.30). For example, wetland soils provide services by supporting healthy vegetation and diverse plant communities that in turn provide animals with foraging opportunities, nesting or denning areas, and protective cover. Examples of human use services provided by natural resources include recreation opportunities for fishing, boating, and wildlife viewing and appreciation.

³ DEV is a state regulated business unit of the parent company Dominion Energy, Inc.

The OPA NRDAR process consists of three phases:

- 1) Preassessment
- 2) Restoration Planning
- 3) Restoration Implementation

By undertaking a NRDAR, the trustees consider the extent of injuries to natural resources, including services provided by the injured resource, while determining the appropriate ways of restoring the injured resources and compensating for these injuries. Trustees use the information obtained during the Preassessment to inform the Restoration Planning, including the development of a restoration plan for the “restoration, rehabilitation, replacement, or acquisition of the equivalent of the natural resources under their trusteeship.” Trustees may seek damages for these injuries, including the reasonable costs of the assessment (OPA 33 U.S.C. § 2702(b)(2)(A)).

Trustee technical representatives evaluated categories of injuries and extent of injury and service losses for the DEV CCS Spill. They also identified and evaluated potential restoration projects and project types to address injury and compensate for the service losses due to the DEV CCS Spill.

1.2 Natural Resource Trustees and Authority

The natural resource trustees that manage or control the natural resources and their services affected by the DEV CCS Spill are the United States Department of the Interior (DOI) represented by the United States Fish and Wildlife Service (USFWS) and the National Park Service (NPS); the District of Columbia represented by the Department of Energy and Environment (DOEE), and the Commonwealth of Virginia, acting through the Secretary of Natural Resources and the Virginia Department of Environmental Quality (VDEQ) (collectively referred to as “Trustees”). 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 (40 C.F.R. §§ 300.600 and 300.605). As a designated Trustee, each agency is authorized to act on behalf of the public to assess and recover natural resource damages and to develop and implement actions to restore natural resources and resource services injured or lost as the result of a discharge of oil.

This DARP/ECA was prepared jointly by the Trustees in accordance with the OPA (33 U.S.C. § 2701, *et seq.*), the OPA NRDAR regulations (15 C.F.R. Part 990), and the System Unit Resource Protection Act (SURPA) (54 U.S.C. §§ 100721-100725). Consistent with federal law, the DOI evaluated the preferred alternative for compliance with other applicable laws; the analyses are included as Appendix A, “Categorical Exclusion Form”. For the DEV CCS Spill, other applicable laws and regulations include:

- National Environmental Protection Act (42 U.S.C. § 4321 *et seq.*)
- Endangered Species Act of 1973, as amended, 16 U.S.C. § 1531, *et seq.*
- National Historic Preservation Act of 1966, as amended, 16 U.S.C. § 470, *et seq.*

1.3 Overview of the Dominion Energy Virginia Crystal City Substation Spill

On January 24, 2016 a transformer tank rupture at the CCS, owned by DEV, resulted in the discharge of approximately 13,500 gallons of mineral oil dielectric fluid. Abatement documents report 11,120 gallons of oil were recovered from spill containment facilities and concrete vaults that prevented product from leaving CCS property⁴. An undetermined quantity of oil was observed off of the CCS property in the George Washington Memorial Parkway (GWMP) Roaches Run Waterfowl Sanctuary (RRWS) and an oil sheen was reported in the Potomac River between I-395 and the Woodrow Wilson Bridge, a distance of 7.4 miles downstream of the CCS. (Figure 1-1). Subsequent investigations by the U.S. Coast Guard (USCG) resulted in DEV accepting the role of Responsible Party (RP) on February 12, 2016. Spill reporting by the VDEQ Pollution Response Program continued until February 9 (Situation Reports #1-7) and included reported injuries to waterfowl, shorebirds, wading birds, mammals, and fish. Cold temperatures, snow and ice during the DEV CCS Spill may have affected the behavior of the oil as well as wildlife detection and recovery from contact with the oil.

Pursuant to the OPA NRDAR regulations, the Trustees invited DEV to participate in a cooperative NRDAR. DEV agreed with the Trustees to perform a cooperative restoration-based assessment to address potential or actual natural resource injuries and lost services from the DEV CCS Spill. Through response activities and during the Preassessment phase the Trustees identified that birds, mammals, and fish were affected by the DEV CCS Spill. Based upon the data collected during the Preassessment, the Trustees determined actual or potential injuries to natural resources and services occurred that would not be restored by response actions.

⁴ An estimated additional 1,967 gallons of oil entrained in soil and gravel were also recovered from the CCS facility. The Initial Abatement Report dated February 26, 2016 and associated DEV response to DOEE's request for additional information contains a detailed description of the spill and oil recovery.

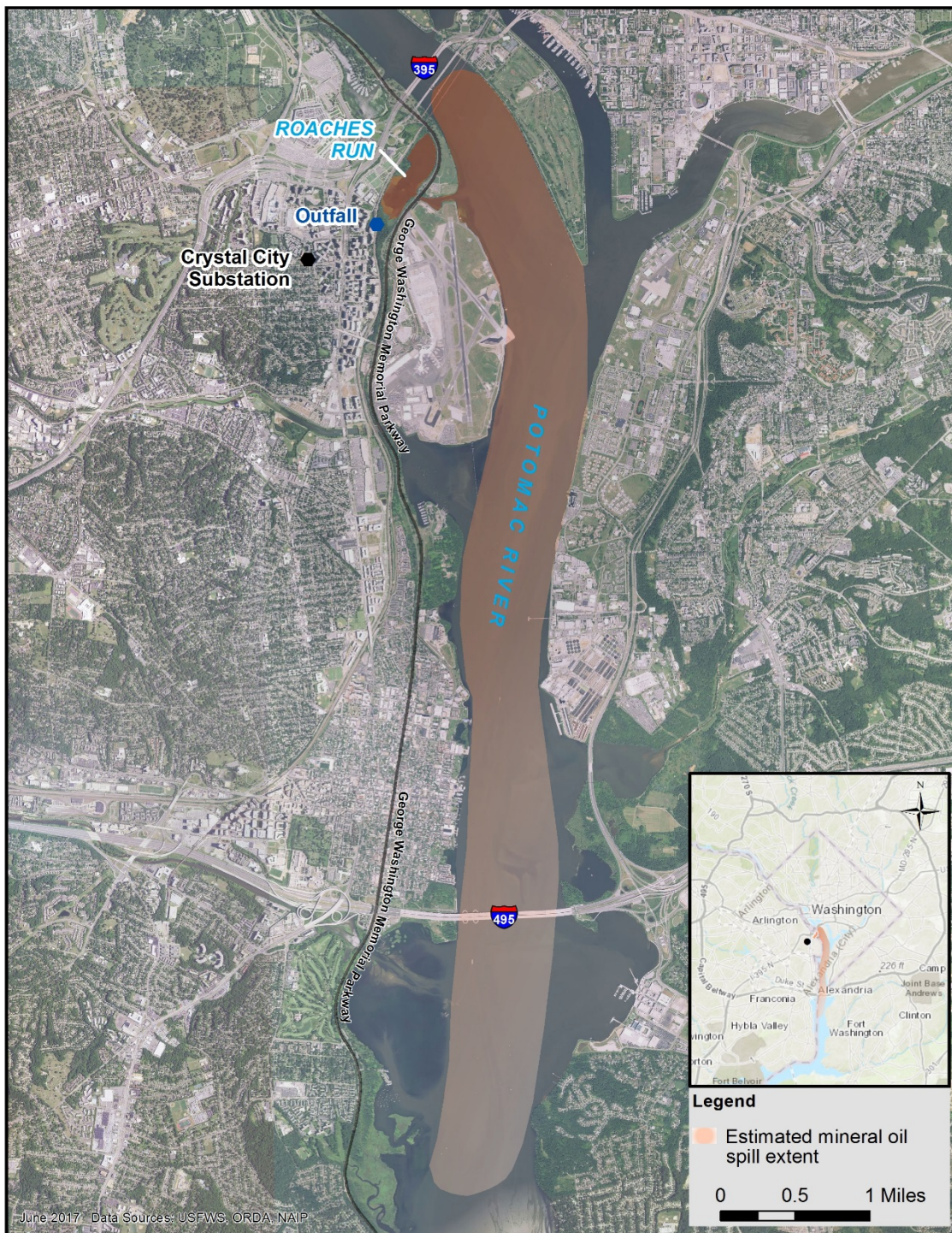


Figure 1-1. Location and Extent of the Dominion Energy Virginia Crystal City Substation Oil Spill on January 24, 2016 in Arlington, Virginia. Spill limit is estimated from incident spill reports.

1.4 Summary of the Settlement

The proposed settlement agreement was documented in a draft Settlement Agreement, notice of which was published in the Federal Register for public review and comment simultaneously with the release of the draft DARP/ECA and finalized after public review. Under the settlement, DEV agrees to pay \$390,385.00 to resolve its potential natural resource damages liabilities arising from the DEV CCS Spill. Of this amount, the Trustees will use \$327,178.00 to fund the preferred restoration alternative identified in Section 3.3. The remaining funds will be used by the Trustees for administrative costs associated with restoration planning, implementation, and monitoring. As part of the cooperative assessment process for the DEV CCS Oil Spill NRDAR, DEV has previously reimbursed incurred assessment costs of DOI in the amount of \$76,090.64 and the Commonwealth of Virginia in the amount of \$12,271.11.

1.5 Organization of the Damage Assessment and Restoration Plan

Chapter 2 provides the Trustees' assessment of injury to natural resources. The Trustees' assessment used validated data from the response and other sources to determine the nature and extent of injuries to natural resources. Although additional assessment work may have assisted in confirming the extent of injuries to natural resources and natural resource services, the Trustees decided to move more expeditiously toward the goal of restoration.

Chapter 3 describes the restoration alternatives the Trustees considered to return the resources injured by the DEV CCS Spill to their pre-spill condition and to compensate for the interim loss pending restoration. The Trustees identified a reasonable range of restoration alternatives, evaluated those alternatives, and selected a preferred alternative using the criteria at 15 C.F.R. § 990.54, as well as additional site-specific criteria.

As a part of this process, the Trustees considered the extent to which the restoration alternatives would provide benefits to more than one natural resource and/or service. Overall, the Trustees are proposing to implement the most geographically proximate and feasible alternative that is expected to provide the restoration benefits required by these criteria. The Trustees' preferred alternative provides the most economical and effective use of settlement funds.

1.6 Public Participation and Response to Comment

Public review of the draft DARP is an integral component of Restoration Planning (15 C.F.R. § 990.55). Through the public review process, the Trustees sought public comment on the natural resource damage assessment conducted by the Trustees, the restoration alternatives considered, and the Trustees' preferred restoration alternative to restore injured natural resources or replace lost resource services.

The draft DARP was open for public comment for 30 days from the date of publication in the Federal Register, February 6, 2018 through March 9, 2018. The notice of availability of the draft DARP and the opportunity for the public to provide comments was referenced in a Federal Register Notice of Availability and a notice of availability was published in the Arlington Connection newspaper.

The Trustees reviewed and considered comments received during the public comment period prior to finalizing the DARP. Only two comments were received: one stating full support for the proposed restoration project and another stating support for the proposed restoration project (Alternative 3, “Enhancement of Habitat at RRWS and Educational Signage”; see Section 3.2.3) but also recommending that it be expanded to incorporate proposals under Alternative 4, “Water Quality Improvements – Best Management Practices and Construction of Trash Cage” (see Section 3.2.4). The Trustees agree that these types of projects would be beneficial and “mitigate other water quality hazards”; however, installation of a trash cage is not feasible in RRWS and information or options were lacking for other projects or expected benefits under this alternative (see Table 3-1).

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

Trustees have maintained records documenting the information considered and actions taken during this NRDAR process. These records are available on [Dominion Energy Virginia DARP](#). Physical copies of the records are also available for review by interested members of the public, however arrangements must be made in advance to review or obtain copies of these records by contacting the Natural Resource Office at the George Washington Memorial Parkway at (703) 289-2500. Access to and copying of these records is subject to all applicable laws and policies, including, laws and policies relating to copying fees and the reproduction or use of any material that is copyrighted.

2.0 INJURY ASSESSMENT AND QUANTIFICATION

2.1 Mineral Oil Dielectric Fluid Toxicity Profile

The product discharged from the CCS was tradename Caltran 60-15 consisting of hydrotreated light naphthenic petroleum distillates, a non-conductive highly refined petroleum distillate used in transformer cooling and regulated under OPA. Also known as mineral oil dielectric fluid or transformer oil, the classification “dielectric fluid” is applied to fluids meeting the required properties for use as electrical insulators in high voltage applications. Their main purpose is to prevent or rapidly suppress electric discharges.

The toxicological effects of mineral oil were evaluated through multiple studies in the late 1980s and throughout the 1990s (FDEP 2016). These studies are the basis for the findings and recommendations included in Material Safety Data Sheets. A hydrocarbon, mineral oil is an aspiration hazard and has produced tumors in animal studies and caused allergic skin reactions (Calumet 2009). It is insoluble in water and manufacturers recommend it be “kept out of surface waters and any water courses or sewers entering or leading to surface waters”. As with all refined oils, the water repellency and insulative properties crucial to birds from their feathers are compromised upon contact and subsequent saturation with mineral oil.

2.2 Assessment Strategy

The goal of an injury assessment is to determine the nature and extent of injuries to natural

resources and to quantify the resulting resource and service losses, providing a basis for evaluating the need for, type of, and scale of restoration actions. The Trustees conducted inspections of the areas affected by the spill and reviewed data collected from spill response agencies to document natural resource injuries and recovery. The Trustees also reviewed restoration alternatives. The scale (or size) of the restoration action should be that which provides the value to adequately offset the natural resource 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.

2.3 Quantification of Injury

As part of Unified Command's response to the DEV CCS Spill various monitoring surveys and assessments were conducted by VDEQ, DOEE, and the USCG. The National Oceanic and Atmospheric Administration's Shoreline Cleanup and Assessment Technique (SCAT) was utilized during the response to identify the extent of the spill, evaluate potential impacts, and determine whether further action or cleanup was needed. SCAT reconnaissance was conducted via landside inspections, waterside inspection, and aerial inspections via helicopter. Based on the shoreline SCAT, the Unified Command (UC) determined that no further cleanup or treatment of the shoreline was needed. Based on the SCAT conducted by the UC and the Incident Management Team, the Trustees determined that quantification of injury to the shoreline along the extent of the DEV CCS Spill would not provide further value to the overall restoration efforts.

To support injury determination, the trustees may assess injury based on physical, chemical, or biological adverse changes in a resource resulting from exposure to oil from a spill. Examples of these injuries include changes in an organism's reproductive success, or death. For the DEV CCS Spill NRDAR, birds were identified as the representative resource for the ecological injury due to the amount of data available showing evidence of injury (death) and the overlapping restoration needs of the impacted resources. For example, restoration projects designed to compensate for the injury to birds in this case, (*e.g.*, wading birds, diving ducks, and dabbling ducks) will most likely provide benefits to multiple other wetland or aquatic species that also may have been impacted (*e.g.*, sediment invertebrates, fish, or wetland plants).

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 compromises 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 via oiled food items with potential subsequent effects of intestinal irritation or "slight laxative effect" (FDEP 2016).

Fifty-nine birds were known to have been killed or impacted by the discharge of oil from the CCS (VDEQ 2016, Table 2-1). However, 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 away, are scavenged, or are overlooked by search teams (Burger 1993; Sperduto et al. 1998, 2003). Total mortality is often calculated by applying a multiplier to the collected carcasses (Ford et al. 1987). The multiplier varies based on several factors, including but

not limited to, size of animal, amount of area searched, duration between searches, and other environmental conditions.

Table 2-1. Resource injury by bird guild and species from the Dominion Energy Virginia Crystal City Substation Oil Spill on January 24, 2016. Arlington, Virginia (McGowen 2016).

Bird Guild	Species	Mortalities (site and in custody)	Released Live
Goose	Canada Goose	7	30
Dabbling duck	Mallard	6	1
Diving duck/ Sea duck	Lesser Scaup	3	-
Diving duck/ Sea duck	Merganser	4	-
Wading bird	Black-crowned Night Heron	2	-
Wading bird	Great Blue Heron	5	-
Gull	Ring Bill Gull	1	-
	Total:	28	31

Resource Equivalency Analysis (REA) is commonly used in NRDAR to quantify injuries and scale restoration. A REA responds to the question, “What would have happened to the injured species if it had not been killed by the oil spill?” and also addresses the expected losses to future generations. REA is a resource-to-resource approach that assumes services lost and restored are comparable. The size of species populations over time is used as the indicator of service losses, expressed in units of measure such as bird-years.

To help ensure timely restoration and limit total assessment costs, Trustees adapted the REA results of similar bird guilds developed in the assessment for the M/T Athos Spill (Athos Spill).⁵ This model applied guild-specific detectability rates (multipliers ranging from 0.75 to 0.98) based on site-specific data and expert knowledge to calculate the total mortality. The Athos Spill analysis also incorporated guild-specific life history information to estimate the lost reproduction for one generation in order to calculate the total losses (including lost reproduction). Trustees adapted this analysis to calculate the expected total losses from the DEV CCS Spill for the guilds impacted. The

⁵ [Athos Oil Spill Final Bird and Wildlife Injury Assessment](#)
[Athos Final Restoration Plan and Environmental Assessment](#)

Trustees estimated total birds killed ranged from 113-247 (depending on if birds that were oiled, cleaned, and released, were counted as mortalities).

2.4 Restoration Scaling and Damages Determination

Following the Athos Spill restoration scoping and scaling process, the Trustees sorted the bird losses into three categories: (1) gulls, diving ducks/birds and wading birds; (2) dabbling ducks; and (3) geese (see Table 2-1). The Athos-developed “restored birds per acre” for each of these three categories was applied to birds killed in this case to determine the numbers of acres that need to be replaced. Since the primary injury associated with the release of mineral oil from the CCS was to migratory birds and given the relatively small scale of this Spill, for purposes of claim development, the Trustees determined that a freshwater wetlands project would best offset the losses by providing foraging and loafing habitat (see Section 3.0). Trustees assessed up to 6.0 acres of habitat restoration to compensate for the injured birds. For settlement purposes, Trustees agreed to 5.3 acres of wetland enhancement as compensation for injuries resulting from the DEV CCS Spill.

2.5 Lost Recreational Use of George Washington Memorial Parkway

The CCS is located on the west side of the Potomac River in an urban neighborhood of 16,000 residents within Arlington County, Virginia. Several historic and nationally significant properties owned and managed by the NPS occur in or near the area affected by the release and response actions to recover the spilled oil. These areas include RRWS, Gravelly Point, Mount Vernon Trail, and the GWMP.

The Gravelly Point Parking Area was used as a base for spill response for a total of 16 days, from February 4, 2016 through February 19, 2016. Although the Parking Area was not completely closed, visitors were not able to access portions of the Parking Area, reducing their ability to access the Mt. Vernon Trail, the Potomac River, and other public sites along the Potomac River. Visitor data for February 2016 recorded 41,022 visitors. The average number of trips to Gravelly Point Parking Area during February 2011-2014 was 43,383 visitors⁶. Thus, the DEV CCS Spill caused a loss of approximately 1,302 trips when pro-rated over the 16 response days.

3.0 RESTORATION ALTERNATIVES

This section describes the restoration alternatives the Trustees developed and considered to return the natural resources and services injured by the DEV CCS Spill to their baseline condition and to compensate the public for the interim losses.

As described above, the goal of NRDAR is to restore the natural resources and their services injured as a result of the discharge of oil. OPA recommends that this goal be achieved by returning injured natural resources to their baseline condition (that existed prior to the spill) 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.

⁶ [National Park Service Visitor Use Statistics](#)

In accordance with OPA NRDAR regulations, the Trustees developed restoration alternatives and selected a preferred alternative to address the resource injuries and service losses resulting from the DEV CCS Spill. In developing restoration alternatives, the Trustees must consider both primary and compensatory restoration options (15 C.F.R. § 990.53). Restoration actions work to directly restore injured natural resources and services to baseline on an accelerated time frame. These actions are intended to compensate the public for the loss of natural resources and services during the interim time period between the injury occurrence and the eventual recovery of the resource or service.

As part of the effort to develop restoration alternatives, the Trustees consulted with local scientists, state, and local natural resource 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 alternatives that are potentially feasible, have strong net environmental benefits, and compensate the public for injuries resulting from the DEV CCS Spill.

3.1 Evaluation Criteria for Selecting Preferred Restoration Alternative

OPA NRDAR regulations require the Trustees to consider six criteria when evaluating restoration alternatives (15 C.F.R. § 990.54). For this Spill, the Trustees used the criteria, listed below, to evaluate restoration alternatives and select a preferred alternative. The criteria are not ranked in order of priority:

1. Project cost and cost effectiveness: The Trustees consider the cost of an alternative, including design, implementation, and long term maintenance and monitoring relative to benefits of a project to the injured natural resources and services lost.

2. Project goals and objectives: The Trustees consider the extent to which each alternative is expected to meet the Trustees' goals and objectives in returning the injured natural resources and services to baseline and/or compensating for interim losses. The Trustees consider the ability of a restoration alternative to provide resources and services of the same type and quality that were lost. Alternatives that restore, rehabilitate, replace, or acquire the equivalent of the same type of resources and services injured by the DEV CCS Spill are preferred to projects that benefit similar, but different resources or services.

3. The likelihood of success: The Trustees consider the technical feasibility of each alternative in achieving the restoration goals and the risk of failure or uncertainty that the goals can be met and sustained. The Trustees will generally not support an alternative which utilizes techniques that are unproven or that are designed primarily to test or demonstrate unproven technology.

4. Avoidance of adverse impact: The Trustees consider whether a restoration alternative may harm natural resources and the environment. Alternatives that avoid or minimize adverse impacts to the environment and natural resources are preferred.

5. Multiple resource and service benefits: The Trustees consider whether a restoration

alternative will provide benefits that address multiple resource injuries or service losses, or that provide ancillary benefits to other resources or resource uses. An alternative that provides multiple resource and service benefits is preferred.

6. Public health and safety: The Trustees consider whether an alternative will pose unacceptable risks to public health and safety.

7. Geographic proximity: The Trustees consider the location of the restoration alternative. A project that is physically located nearby to where the injuries occurred is preferred.

For the DEV CCS Spill the key criteria for the Trustees are: the extent to which an alternative will compensate for the same type of injuries and losses, the likelihood of its success, and geographic proximity to the natural resource injury and lost services.

3.2 Restoration Alternatives Considered

The following subsections discuss possible alternatives for restoration, provide an evaluation of each alternative as compared to the restoration evaluation criteria discussed above, and describe the preferred alternative selected by the Trustees for implementation. Table 3-1, located at the end of this section, summarizes the results of the Trustees' evaluation.

3.2.1 Alternative 1 - No action/Natural Recovery

OPA requires the Trustees to evaluate an alternative in which no actions are taken by a State or Federal agency to restore the injured natural resources affected by the DEV CCS Spill. Under natural recovery, the Trustees would take no direct action to compensate for interim losses, pending recovery, associated with the injured migratory birds and lost visitation at GWMP. The Trustees would allow natural processes to occur, which could result in the interim losses of natural resources not being restored. If Trustees selected this alternative, the public would not be compensated for the losses in natural resources and services caused by the DEV CCS Spill. A No Action alternative is not appropriate for the DEV CCS Spill and the Trustees reject this alternative. The OPA establishes Trustee authority to seek compensation for interim losses, and technically feasible restoration approaches are available to compensate for these losses associated with the DEV CCS Spill.

3.2.2 Alternative 2 - Restore Dyke Marsh Wetlands

Alternative 2 involves supplementing an existing plan to create or restore vegetated wetlands in order to offset the injuries to the migratory birds. The NPS and U.S. Army Corps of Engineers (USACE) are cooperating on the restoration of Dyke Marsh, which is located in the GWMP. NPS and USACE received funding for this project from the Disaster Relief Appropriations Act (Pub.L. 113-2) for construction of a breakwater and restoration of wetlands. The costs for the project are uncertain at this point, and it is unknown how many acres of wetlands will be restored. This alternative would utilize recovered NRDAR funds to leverage additional restoration of Dyke Marsh, or for additional monitoring and adaptive management of the NPS/USACE restoration in the future. Additional information about Dyke Marsh can be found at [Dyke Marsh Wetland Restoration and](#)

[Long Term Management Plan/EIS](#) (NEPA Environmental Impact Statement), or the USACE project page at [US Army Corps of Engineers Dyke Marsh Wildlife Preserve Restoration](#).

The Trustees reject this alternative. Although the Dyke Marsh Environmental Impact Statement has been finalized, the NPS has funding for this project, including monitoring and adaptive management. Additionally, the cost per acre of restoring the wetlands at Dyke Marsh is significantly higher than the cost of enhancement of wetlands under Alternative 3, making this alternative less cost effective. While it is possible that there could be a shortfall in funds, the additional uplift in services that this project would provide is not plainly evident.

3.2.3 Alternative 3 – Enhancement of Habitat at Roaches Run Waterfowl Sanctuary and Educational Signage

Alternative 3 involves planting approximately 5.3 acres of cattails and other native vegetation in RRWS to enhance the function of freshwater wetlands. The additional vegetation would enhance existing waterfowl, wading bird, and shorebird habitat within the waterfowl sanctuary (Fig. 3-1). The additional habitat will also benefit multiple wetland resources such as benthic invertebrates, fisheries, and improve overall water quality within RRWS and in the Potomac River. Educational signs about the unique habitat at RRWS and the bird and wildlife species that are present would be included to enhance the visitor experience. Additional signs at RRWS and Gravelly Point will focus on discouraging the public from feeding and attracting wildlife.

Plant establishment will occur at a site north of Runway 15-33 associated with Ronald Reagan Washington National Airport. The enhancement site and vegetation species selection are designed to discourage any potential aircraft-bird strikes that may occur as a result of the project. Narrowleaf cattail (*Typha angustifolia*) and arrow arum (*Peltandra virginica*) have the ability to form thick continuous stands that are undesirable to the 4 bird species (Canada Geese, Gulls, Hawks, and Vultures) most commonly involved in aircraft strikes (MOU 2003). Use of these plant species is intended to reduce the occurrence of these bird species at the area of RRWS associated with the north end of Runway 15-33. Further efforts involve the use of temporary enclosures with netting to prohibit use of the enhancement area by birds, mammals, and reptiles until plants are fully established and mature. The expectation is that at a mature stage of plant establishment the restoration area will not be desirable to bird species most commonly involved in aircraft strikes.

Enhancement of habitat in RRWS is technically feasible. The property is currently owned and managed by the NPS. The Trustees recognize that while the project will not directly benefit preferred habitat of Canada Geese and gulls injured by the DEV CCS Spill these species will be served by trophic level benefits (primary productivity and food web interactions) that will occur as a result of the project. The Trustees conclude that the enhancement of wetlands in the RRWS and addition of signage would compensate the public for services lost due to the Spill. The Trustees selected this alternative as the preferred restoration alternative.



Figure 3-1. Locations of Proposed Native Wetland Vegetation Establishment in Roaches Run Waterfowl Sanctuary, Arlington County, Virginia.

3.2.4 Alternative 4 – Water Quality Improvement: Best Management Practices and Construction of Trash Cage

This alternative involves improvement of water quality within RRWS and the Potomac River through the implementation of a combination of Best Management Practices, (*e.g.*, rain gardens, bioretention, green streets, green infrastructure projects,) and construction of trash collection devices or “traps” located at stormwater outfalls. The contributing area for RRWS has a high percentage of impervious area (67%) (Arlington County Stormwater Master Plan 2014) and trash is found throughout the site, impacting vegetation and wildlife. Preliminary evaluation of the suitability of installing a trash trap at RRWS was not favorable. Lack of access needed for construction, maintenance, and regular collection of debris made the proposal infeasible and not cost effective.

No locations in the vicinity of RRWS for the other BMPs, such as rain gardens and green infrastructure, were immediately known. While it may have been possible for the Trustees to develop this information over time, it would have delayed the restoration of migratory birds and replacement of the lost recreational use of the GWMP as a result of the Spill.

Another option was to explore other locations in the watershed that may be better suited to this kind of work or other types of BMPs that improve water quality but may not be focused on catching trash, *e.g.*, rain gardens, bioretention, green streets, green infrastructure projects, etc. None of these options were readily identified. The Trustees reject this alternative as not being technically feasible at this time.

3.3 Preferred Restoration Alternative

The Trustees selected Alternative 3 as the preferred restoration alternative: enhancement of freshwater wetlands as habitat used by waterfowl and shorebirds and improvement in water quality at Roaches Run Waterfowl Sanctuary within the GWMP and educational signs. This alternative meets all the selection criteria and best meets the Trustees’ goals and objectives to bring migratory birds to baseline conditions and to compensate for the lost visitor use in GWMP (Table 3-1).

**Table 3-1. Evaluation of Alternatives According to the Trustees’ Restoration Evaluation Criteria.
Restoration Alternatives 1-4**

Alternative	Project	Restoration Evaluation Criteria
1	No Action/Natural Recovery	<ol style="list-style-type: none"> 1. Cost effectiveness: Not applicable. 2. Meet goals and objectives: Fail. Does not offset injuries caused by the oil spill. 3. Likelihood of success: Fail. Interim losses due to oil spill not restored. 4. Avoids adverse impacts: Not applicable. 5. Multiple resource/service benefits: Fail. Benefits no resources. 6. Public health and safety: Not applicable. 7. Geographic proximity: Not applicable.

Alternative	Project	Restoration Evaluation Criteria
2	Restore Dyke Marsh Wetlands	<ol style="list-style-type: none"> 1. Cost effectiveness: Fail. Restoration costs per acre at this site are comparatively higher. 2. Meet goals and objectives: Fail. Project was planned and funded prior to injury. Unclear how settlement funds would provide additional uplift or offsets to injured resources. 3. Likelihood of success: Unknown. Project follows proven methods for wetland restoration and NPS is to monitor and maintain the wetlands; however, it is unknown how the settlement funds could be utilized within this project to determine success. 4. Avoids adverse impacts: Pass. Restores historic wetlands. 5. Multiple resource/service benefits: Pass. Benefits water quality, wildlife, and human use. 6. Public health and safety: Pass. Adds no unacceptable risks to public health and safety. 7. Geographic proximity: Approximately 6.5 miles from oil spill injury.
3	Roaches Run Waterfowl Sanctuary Restoration	<ol style="list-style-type: none"> 1. Cost effectiveness: Pass. Cost effective relative to the resource and service losses and expected benefit. 2. Meet goals and objectives: Pass. Benefits migratory birds. Offsets water quality and biological food web losses. 3. Likelihood of success: Pass. Proven methods. NPS to monitor and maintain. 4. Avoids adverse impacts: Pass. Restores historic wetlands. 5. Multiple resource/service benefits: Pass. Benefits water quality, wildlife, and human use. 6. Public health and safety: Pass. Adds no unacceptable risks to public health and safety. 7. Geographic proximity: Site of oil spill injuries.

Alternative	Project	Restoration Evaluation Criteria
4	Best Management Practices and Establishment of Stormwater Outfall Trash Cage	<ol style="list-style-type: none"> 1. Cost effectiveness: Fail. Site specific. Time expense in identifying and assessing sites. Requires engineering assessment and design. 2. Meet goals and objectives: Pass. Offsets water quality losses and may improve habitat conditions for wildlife and fish. 3. Likelihood of success: Unknown. Dependent on accessibility. RRWS is inaccessible for installation of a trash cage. Method success demonstrated at other sites. Uses accepted engineering and construction techniques and practices. 4. Avoids adverse impacts: Pass. Addresses ongoing injury and contamination from other sources affecting water quality. 5. Multiple resource/service benefits: Pass. Benefits water quality, wildlife, human health and aesthetics. 6. Public health and safety: Pass. Evaluated by DOEE. Poses no unacceptable risks to public health and safety. 7. Geographic proximity: Unknown. Sites within the immediate vicinity were unknown and/or inaccessible. Appropriate sites within the watershed might be miles from oil spill injury.

3.4 Monitoring and Performance Criteria for the Preferred Alternative

Restoration at RRWS will be implemented by the NPS who will also monitor and maintain the project. Beginning the following growing season after planting, NPS personnel or their representative will perform qualitative monitoring of the RRWS restoration periodically to ensure that the enclosures are still intact and performing adequately, measure for native plant survival and colonization by invasive non-native undesirable species for a period of 5 years or until successful plant establishment has been achieved. In the event that there is plant failure, and/or removal of invasive species is needed, the NPS will submit plans and requests to the Trustee Council for replanting funds, which are included in the proposed settlement. The goal of the project is to achieve 75% cover among planted native plants for 3 years and no more than 5% cover of undesirable invasive species each year after project completion. Invasive plants are defined by lists maintained by the Virginia DCR Department of Natural Heritage.

Annually, the NPS will prepare a status report on the implementation and monitoring of the RRWS restoration project for the Trustees, including a summary of expenses and remaining funds balance for the project. The annual status reports will be made available to the public on the case website upon agreement of all Trustees. The project will be considered complete when all funds allocated for the project are spent.

Data collection, management, analysis and reporting will follow the National Capital Region

Inventory and Monitoring Network data management plan where applicable, which can be found at: ([National Capital Region Data Management](#)).

4.0 CONCLUSION

The January 2016 DEV CCS Spill resulted in documented injuries to migratory birds and other natural resources within RRWS and the Potomac River and lost recreation at the GWMP. The objective of any restoration action under the OPA NRDAR process is to restore or replace natural resources and the services such resources provide injured from the discharge of oil. To meet that objective, the benefits of a restoration project must be related, or have an appropriate nexus to, the natural resource injuries and losses due to the unpermitted discharge of mineral oil from the DEV CCS.

The preferred restoration alternative selected by the Trustees in this DARP/ECA is enhancement of wetland habitat within Roaches Run Wildlife Sanctuary in the GWMP and educational signage. The establishment of native vegetation within this existing wetland will be beneficial to wildlife and provide ecological benefits to birds as well as improve water quality to the Potomac River. The signs will educate the public about the type of habitat and species of birds that utilize the RRWS, as well as discourage human activity that attracts wildlife.

5.0 REFERENCES

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National Park Service
U.S. Department of the Interior

George Washington Memorial Parkway
Date: 01/29/2018

Categorical Exclusion Form

Project: Roaches Run Restoration

PEPC Project Number: 75794

Description of Action (Project Description):

On January 24, 2016 a transformer tank rupture at the Crystal City Substation (CCS), owned and operated by Dominion Energy Virginia (DEV), resulted in the discharge of approximately 13,500 gallons of mineral oil dielectric fluid. The Crystal City Substation is located at 18th Street South and South Fern Street in Arlington County, Virginia. Abatement documents report 11,120 gallons of product were recovered from spill containment facilities within the CCS property. An undetermined quantity of oil was observed off of the CCS property in the Roaches Run Waterfowl Sanctuary within the George Washington Memorial Parkway and the Potomac River to the Woodrow Wilson Bridge, a distance of 7.4 miles downstream of the CCS. This discharge is referred to as the Dominion Energy Virginia Crystal City Station Oil Spill, herein referred to as the DEV CCS Spill.

Roaches Run Vegetative Planting will be implemented by the NPS who will also monitor and maintain the project. Crews will prepare the site for native plant establishment by removing and clearing undesirable vegetation. Upon completion, NPS will plant cattails (approximately 100,000) to the specified species (Narrow Leaf Cattail [*Typha angustifolia*] and Arrow Arrum [*Peltandra virginica*]), density, and location, as well as build approximately 600 20 x 20-foot enclosures around the plants to ensure they are able to establish themselves (e.g., protection from waterfowl). Beginning the following growing season, NPS personnel will monitor and maintain the site to ensure undesirable species do not recolonize the site and newly established plants survive. NPS will continue its monitoring as provided above. The enclosures will remain in place for approximately two years. Annually, the NPS will prepare a status report on the implementation and monitoring of the Roaches Run restoration project for the Trustees, including a summary of expenses and remaining funds balance for the project. The annual status reports will be made available to the public on the case website upon agreement of all Trustees. The project will be considered complete when all funds allocated for the project are spent.

Project Locations:

Location

County:	Arlington	State:	VA
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Mitigation(s):

- The protective cells shall make use of dark colored fencing material to lessen its visibility to visitors and parkway travelers. Additionally, efforts shall be made to reduce the overall massing of the protective cells, where practicable, to further reduce their visibility.
- Only the two species presented in the restoration plan shall be planted (i.e., Narrow Leaf Cattail, Arrow Arrum). Any additions or substitutions will require further compliance review and approval.
- All disturbed areas shall be restored to conditions equal to or better than before the start of the project.
- In the event archeological resources are discovered during the project, work will immediately halt and GWMP Cultural Resources Management notified so the site/find can be examined prior to resuming work.

Categorical Exclusion Form - Roaches Run Restoration - PEPC ID: 75794

Appendix A. Environmental Compliance Analysis

CE Citation: E.2 Restoration of noncontroversial native species into suitable habitats within their historic range and elimination of exotic species.

CE Justification:

This project will replace a non-native Phragmites plant community with a native narrow-leaf cattail community.

Decision: I find that the action fits within the categorical exclusion above. Therefore, I am categorically excluding the described project from further NEPA analysis. No extraordinary circumstances apply.

Signature

Superintendent:



Alexcy Romero

Date:



Appendix A. Environmental Compliance Analysis

Extraordinary Circumstances:

If implemented, would the proposal...	Yes/No	Notes
A. Have significant impacts on public health or safety?	No	
B. Have significant impacts on such natural resources and unique geographic characteristics as historic or cultural resources; park, recreation, or refuge lands; wilderness areas; wild or scenic rivers; national natural landmarks; sole or principal drinking water aquifers; prime farmlands; wetlands (Executive Order 11990); floodplains (Executive Order 11988); national monuments; migratory birds; and other ecologically significant or critical areas?	No	
C. Have highly controversial environmental effects or involve unresolved conflicts concerning alternative uses of available resources (NEPA section 102(2)(E))?	No	
D. Have highly uncertain and potentially significant environmental effects or involve unique or unknown environmental risks?	No	
E. Establish a precedent for future action or represent a decision in principle about future actions with potentially significant environmental effects?	No	
F. Have a direct relationship to other actions with individually insignificant, but cumulatively significant, environmental effects?	No	
G. Have significant impacts on properties listed or eligible for listing on the National Register of Historic Places, as determined by either the bureau or office?	No	
H. Have significant impacts on species listed or proposed to be listed on the List of Endangered or Threatened Species, or have significant impacts on designated Critical Habitat for these species?	No	
I. Violate a federal, state, local or tribal law or requirement imposed for the protection of the environment?	No	
J. Have a disproportionately high and adverse effect on low income or minority populations (EO 12898)?	No	
K. Limit access to and ceremonial use of Indian sacred sites on federal lands by Indian religious practitioners or adversely affect the physical integrity of such sacred sites (EO 13007)?	No	
L. Contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area or actions that may promote the introduction, growth, or expansion of the range of such species (Federal Noxious Weed Control Act and Executive Order 13112)?	No	

**Final Damage Assessment and Restoration Plan
for the
Dominion Energy Virginia Crystal City Substation Oil Spill
Arlington County, Virginia**


In accordance with U.S. Department of the Interior (Department) policy regarding documentation for natural resource damage assessment and restoration projects (52I DM 3), the Authorized Official for the Department must demonstrate approval of draft and final Damage Assessment and Restoration Plans (DARPs) and their associated environmental compliance documentation, with concurrence from the Department's Office of the Solicitor.

The Authorized Official for the Dominion Energy Virginia Crystal City Substation Oil Spill is the Deputy Associate Director for the National Park Service's Natural Resource Stewardship and Science.

By the signatures below, the Final DARP is hereby approved.

Approved:


Concurred:



Guy Adema
Deputy Associate Director
Natural Resource Stewardship and Science
National Park Service

5/11/18

Date



Genette Gaffney
Attorney Advisor
Environmental Restoration Branch
Office of the Solicitor

3/16/18

Date

Approved:

Approved:

Jefferson D. Reynolds
Director, Division of Enforcement
Department of Environmental Quality
Virginia

Date

Tommy Wells
Director
Department of Energy and Environment
District of Columbia

Date

**Final Damage Assessment and Restoration Plan
for the
Dominion Energy Virginia Crystal City Substation Oil Spill
Arlington County, Virginia**

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By the signatures below, the Final DARP is hereby approved.

Approved:

Concurred:

Guy Adema
Deputy Associate Director
Natural Resource Stewardship and Science
National Park Service

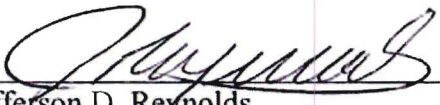
Date

Genette Gaffney
Attorney Advisor
Environmental Restoration Branch
Office of the Solicitor

Date


Approved:

Approved:



Jefferson D. Reynolds
Director, Division of Enforcement
Department of Environmental Quality
Virginia

Date



Tommy Wells
Director
Department of Energy and Environment
District of Columbia

Date

03/28/18

SP