

5. Environmental Consequences

The reasonably foreseeable environmental consequences of the Proposed Action and the No Action Alternative are discussed in this section. The focus of this analysis is on resources that would be directly, indirectly, or cumulatively affected by the Proposed Action. Possible conflicts among the Proposed Action and the objectives of federal, regional, state, local, and tribal land use plans, policies, and controls for the study area and other unresolved conflicts are also addressed.

The Authority's proposed schedule shows that construction of the Proposed Action is anticipated to begin in late 2016 and to be complete by the end of 2022. The first full-calendar year of Airport operation with the Proposed Action in place would be 2023. Impacts related to construction activities were evaluated for the years of construction, 2016 through 2022. Impacts related to Airport operation with the Proposed Action and the No Action Alternative were evaluated based on 2023 conditions.

5.1 Summary of Potential Impacts

Table 5-1 provides a summary of the potential environmental impacts by resource category. Those resources that would not be affected by the Proposed Action or the No Action Alternative are not discussed further in this section, and Table 5-1 provides justification for their exclusion. Neither the Proposed Action nor the No Action Alternative would affect wild and scenic rivers or farmlands, because these resources do not exist at the Airport. The analysis of the potential environmental impacts on the remaining categories determined that no significant impacts are expected to result from implementing the Proposed Action compared to the No Action Alternative. The analysis and conclusions by impact category are discussed below.

Table 5-1 (1 of 3): Summary of Potential Environmental Impacts by Resource Category

RESOURCE CATEGORY	IMPACT POTENTIAL	JUSTIFICATION
Air Quality	No Significant Impact	The Proposed Action emissions do not exceed <i>de minimis</i> levels.
Biological Resources including Fish, Plants, and Wildlife, Federally and State-Protected Species	No Significant Impact	Because of the location and extent of the proposed improvements, the existing operational use of the Airport property, and the transient nature of any species that could use the habitats near the LOPD, it is believed that rare, threatened, or endangered species, species of concern, or Species of Greatest Conservation Need would not be affected by the Proposed Action. There would be no taking or relocation of specimens. There would be no loss of critical terrestrial habitat.
Climate	No Significant Impact	The Proposed Action would not increase fuel burn GHG emissions over the No Action Alternative. GHG emissions associated with the NNC construction and demolition activities from fuel usage are expected; however, these emissions would be temporary and would comprise a very small fraction of the U.S. and global GHG emissions.
Coastal Resources	No Significant Impact	There are no coastal barrier resources protected by the Coastal Barrier Resources Act of 1982 within the LOPD. Furthermore, it is believed that there would be no impacts to Virginia coastal resources protected by the Coastal Zone Management Act, so long as the Proposed Action is designed and constructed in accordance with the local, state, and federal guidelines described throughout this EA, and any corresponding stormwater permits and pollution prevention plans are updated accordingly.
Department of Transportation Act Section 4(f)	No Significant Impact	The Proposed Action would require modifications to the South Hangar Line and minor renovations to Terminal A. SHPO has issued a conditional No Adverse Effect finding. The physical use caused by the alteration of the structure would be a <i>de minimis</i> impact.
Farmlands	None	No farmland resources are present in the vicinity of the Proposed Action.
Hazardous Materials, Solid Waste, and Pollution Prevention	No Significant Impact	The Proposed Action would not require an increase in the use or storage of any hazardous materials, and the operation of the Proposed Action improvements would not generate incremental solid waste.

Table 5-1 (2 of 3): Summary of Potential Environmental Impacts by Resource Category

RESOURCE CATEGORY	IMPACT POTENTIAL	JUSTIFICATION
Historical, Architectural, Archeological, and Cultural Resources	No Significant Impact	The SHPO for the Commonwealth of Virginia concurs that the Proposed Action would not cause an adverse effect on historic resources. Considering that the peninsula on which the airfield was constructed is predominantly manmade, and that the landside facilities are heavily developed, there is very little potential for archeological resources to be affected. An assessment of light emissions and visual impacts concluded that the Proposed Action would not affect nearby land uses or the District of Columbia area viewshed. Tenants from the demolished Hangar 11 would relocate to renovated space in the South Hangar Line. The South Hangar Line and Terminal A are listed on the NRHP. SHPO determined that the renovation to the South Hangar Line and renovations to Terminal A would have no adverse effect on the condition that continued consultation takes place during the design of the new facilities. There are no significant impacts to historic architecture.
Land Use	No Significant Impact	The Proposed Action is consistent with applicable land use plans, policies, and regulations. The Proposed action would not disrupt communities, involve residential or business relocation, or induce socioeconomic impacts.
Natural Resources and Energy Supply	No Significant Impact	The natural resources and energy supply required by the Proposed Action are easily available at the Airport; no resources would be required with the No Action Alternative. Utilities required to support the Proposed Action are already provided at the Airport. Rare construction materials are not needed to implement either alternative.
Noise and Noise-Compatible Land Use	No Significant Impact	The Proposed Action would not result in a significant increase in aircraft noise when compared to the No Action Alternative. The Proposed Action could cause a temporary nighttime construction noise impact that could be mitigated to less than significant.

Table 5-1 (3 of 3): Summary of Potential Environmental Impacts by Resource Category

RESOURCE CATEGORY	IMPACT POTENTIAL	JUSTIFICATION
Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks	No Significant Impact	Neither alternative would result in significant socioeconomic impacts (e.g., residential or business relocations, division or disruption of established communities, alteration of surface transportation patterns, disruption of orderly planned development, or appreciable change in employment). The Proposed Action is contained entirely within Airport boundaries. Furthermore, because neither alternative would result in aircraft noise impacts on residential land uses or noise-sensitive facilities, no disproportionate impacts to minority or low-income populations or children are anticipated. Off-Airport, during construction, the northbound approach of U.S. Route 1 would operate at LOS E during the p.m. off-peak hour compared to the No Action condition operation of LOS D. This temporary construction impact could be mitigated. On-Airport, during construction, there would be a significant impact at the intersection of Route 233 and Abingdon Drive, causing increased delay at this on-Airport intersection.
Visual Effects	No Significant Impact	The Proposed Action is not anticipated to affect the viewshed in the vicinity of the Airport or result in light emissions that would affect nearby land uses or marine navigation.
Water Resources including Wetlands, Floodplains, Surface and Ground Water	No Significant Impact	No fill or alteration of Waters of the U.S. would occur with the Proposed Action. The Proposed Action would not encroach upon a 100-year floodplain. The amount of water contaminants resulting from the Proposed Action improvements potentially affecting stormwater runoff would be unchanged between the Proposed Action and the No Action Alternative. The Proposed Action improvements would be designed and constructed to decrease potential inputs of chemical nutrients and sediments to the adjacent receiving waters.
Wild and Scenic Rivers	None	There are no wild and scenic river resources in the vicinity of the LOPD.
Cumulative Impacts	No Significant Impact	The environmental impacts of each alternative would not be considered significant when added to the impacts of other past, present, and reasonably foreseeable future actions.

NOTES:

LOPD = Limits of Physical Disturbance

LOS = Level of Service

NRHP = National Register of Historic Places

SHPO = State Historic Preservation Office

SOURCES: Ricondo & Associates, Inc., December 2015; HMMH, September 2015; Paciulli, Simmons & Associates, Ltd., September 2015; Wetland Studies and Solutions, Inc., September 2015.

PREPARED BY: Ricondo & Associates, Inc., December 2015.

5.2 Air Quality

Current air quality in the Airport environs is discussed in Section 4.3.3 of this EA, and **Appendix F** provides additional details regarding the air quality analysis. Potential air quality impacts associated with: (1) demolition and construction of the Proposed Action and (2) changes in Airport operational emissions under the Proposed Action, compared to the No Action Alternative, are discussed in this section.

5.2.1 METHODOLOGY

The NEPA of 1969 requires consideration of the relationship of any proposed FAA action to air quality. The primary sources of guidance for NEPA compliance are FAA Orders 1050.1F and 5050.4B, the *1050.1F Desk Reference* and the *Aviation Emissions and Air Quality Handbook, Version 3 Update 1*.^{1, 2} Typically, an emissions inventory is prepared for each reasonable alternative and the no action alternative. Additional analyses, including dispersion modeling or roadway intersection hot spot analyses, are not typically required if the estimated emissions of each criteria pollutant do not exceed thresholds listed in the general conformity regulations. Information presented in the *Airport Air Quality Handbook* can be used as a guide to determine whether a NAAQS assessment should be performed for a proposed action; however, the nature of the project should also be considered in consultation with state or regional air quality regulatory agencies.³

The Clean Air Act Amendments of 1990 (CAAA) require federal agencies to ensure that their actions conform to the appropriate SIP.⁴ Conformity is defined as demonstrating that a project or action conforms to the SIP's purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of such standards. Federally funded and approved actions at airports are subject to the EPA's general conformity regulations. The EPA has published a final rule regarding general conformity determinations.⁵ The final rule includes annual emissions thresholds for nonattainment areas and maintenance areas that trigger the need for a general conformity determination, and it also defines projects that are typically excluded from general conformity requirements.

A conformity determination is required if the total direct and indirect pollutant emissions resulting from a project are above *de minimis* emission threshold levels specified in the conformity regulations.^{6, 7} A

¹ U.S. Department of Transportation (DOT), FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, July 2015.

² Ibid, *Aviation Emissions and Air Quality Handbook Version 3, Update 1* (Report No. DOT/FAA/AEE/2014-12), January 2015.

³ When a proposed action could cause or contribute to an exceedance of the NAAQS, then pollutant concentrations are estimated for criteria pollutants of interest through air dispersion modeling. The FAA's Emissions and Dispersion Modeling System (EDMS) incorporates algorithms from the EPA's AERMOD atmospheric dispersion model.

⁴ *Clean Air Act Amendments of 1990*, PL 101-49, November 15, 1990.

⁵ 40 CFR §93, November 30, 1993, as amended.

⁶ Total direct and indirect emissions are the sum of the emissions increases and decreases associated with a proposed project, or the net change in emissions anticipated to occur as a result of the proposed project (40 CFR §93.152).

⁷ Emissions are so small as to be negligible or insignificant. If a project/action has *de minimis* emissions, then a conformity determination/NAAQS assessment pursuant to the CAAA is not required (40 CFR §93.153c).

conformity determination is not required if the differences in emissions between the Proposed Action and the No Action Alternative are below the applicable *de minimis* emission threshold levels. A conformity determination is not required if the Proposed Action is exempt or included in the FAA list of “presumed to conform activities.” If a conformity determination is required, then the regulation identifies the approaches for showing that an action/project conforms to the appropriate SIP. Federal *de minimis* emission standards for nonattainment areas are listed in **Table 5-2**.

Table 5-2: De Minimis Pollutant Emission Thresholds

POLLUTANT	NONATTAINMENT STATUS	TONS PER YEAR
PM ₁₀	Moderate	100
	Serious	70
PM _{2.5}	All Areas	100
CO	All Areas	100
O ₃	Serious	50
	Severe	25
	Extreme	10
	Other-outside OTR	100
	Marginal and Moderate inside OTR:	
	VOC	50
	NO _x	100
SO ₂ or NO ₂	All Areas	100

NOTES:

CO	Carbon Monoxide	NO ₂	Nitrogen Dioxide
NO _x	Oxides of Nitrogen	O ₃	Ozone
OTR	Ozone Transport Region	PM _{2.5}	Fine Particulates
PM ₁₀	Particulate Matter	SO ₂	Sulfur dioxide
VOC	Volatile Organic Compounds		

SOURCES: *Clean Air Act Amendments*, PL 91-604, December 1970; *Clean Air Act Amendments*, PL 101-549, February 24, 2004.
PREPARED BY: HMMH, July 2015.

5.2.2 PROPOSED ACTION

5.2.2.1 2016 to 2022 Construction Impact Potential

Emissions Inventory

Construction of the Proposed Action would not increase the number of existing or forecast aircraft operations by time of day, aircraft type, stage length, or aircraft operational emissions, as compared to the No Action Alternative. During the years of construction, aircraft operational emissions would be the same for the Proposed Action and the No Action Alternative.

To analyze the criteria pollutant emissions resulting from demolition and construction activities, an emissions inventory was developed for the Proposed Action. Emission sources considered include:

- diesel-powered trucks
- diesel-powered construction equipment
- construction employee vehicles (gasoline)
- land development (fugitive emissions)
- asphalt paving operations (VOC emissions)

Construction activities associated with the Proposed Action on the demolition of Hangars 11 and 12, the COB, NNC, and SSCPs are expected to begin in 2016 and are expected to be completed in 2022. Construction and demolition-related emissions were analyzed using standard industry methodologies and techniques. The specific techniques used to estimate construction and demolition-related emissions under the Proposed Action are described in Appendix F.

Construction-related emissions of criteria pollutants during 2016 to 2022 under the Proposed Action are summarized in **Table 5-3**. As the No Action Alternative would not have any emissions, the construction emissions are the same as the net change in emissions that would result from implementation of the Proposed Action. The net change in construction-related emissions would be below the *de minimis* thresholds presented in Table 5-2 and would not be regionally significant. The differences in construction and demolition-related emissions under the Proposed Action and No Action Alternative would be less than significant. Consistent with FAA guidance, detailed dispersion modeling is not required to assess construction-related air quality impacts associated with the Proposed Action. Implementation of the Proposed Action would not be expected to cause or contribute to exceedances of the NAAQS.

Table 5-3: Construction and Demolition Emissions Inventory—Proposed Action

YEAR	RELEVANT CRITERIA POLLUTANT EMISSIONS (TONS PER YEAR)					
	CO	VOC ^{1/}	NO _x ^{1/}	SO _x	PM ₁₀	PM _{2.5}
2016	0.1867	0.0623	0.7300	0.0005	1.55	0.8366
2017	1.6384	0.4265	5.7043	0.0077	4.9014	3.7585
2018	2.9538	0.8705	12.2491	0.0351	8.4726	4.6417
2019	0.6146	0.2473	1.6258	0.0011	2.6906	2.6099
2020	0.2528	0.3956	0.5848	0.0001	4.6982	2.6139
2021	0.2148	0.3955	0.2994	0.0001	3.8128	1.7551
2022 ^{2/}	0.2148	0.3955	0.2994	0.0001	3.8128	1.7551

NOTES:

1/ Following standard industry practice, ozone was determined by evaluating emissions of VOC and NO_x, which are precursors in the formation of ozone.

2/ Emissions for 2022 were assumed to be the same as 2021, since construction activity is expected to be similar. This was a conservative assumption in that EPA vehicle and fuel regulations are expected to result in lower emissions from year to year due to cleaner engine standards and fleet turnover.

SOURCE: HMMH, December 2015, based on the results of the construction and demolition emissions analysis documented in Appendix F.

PREPARED BY: HMMH, January 2016.

General Conformity Applicability Analysis

The results of a general conformity applicability analysis performed for the Proposed Action are described in this subsection. The Airport is located in Arlington County, which has been designated by the EPA as being in nonattainment of the 8-hour ozone standards. Arlington County is also designated as an attainment/maintenance area for CO and PM_{2.5}. Therefore, the applicable *de minimis* thresholds for general conformity purposes are 100 tons per year of PM_{2.5}, NO_x, and CO, and 50 tons per year for VOC.⁸

The Proposed Action would expand Terminal B/C to enhance customer service levels through a series of improvement projects. The project would result in terminal upgrades with a footprint of approximately 112,400 square feet. The project would not result in an increase in aircraft operations, as the expansions are being implemented to improve passenger conveniences of the building at current passenger levels. The project is located in a moderate ozone nonattainment area where the terminal upgrades “presume to conform” (PTC) thresholds are 185,891 square feet for NO_x and 770,658 square feet for VOCs. The PTC thresholds for NO_x and VOC are the most limiting pollutants for the terminal upgrade as the thresholds for other pollutants are higher. The terminal upgrade activities associated with the NNC fall within the FAA PTC limits under Table III-1, “Terminal Upgrades,” for projects located in a nonattainment area for ozone in the ozone transport region, and these actions would not result in an increase in aircraft operations (see **Table 5-4**). Therefore, NNC activities are “presumed to conform” actions listed under Category 6 of the FAA *Federal Presumed to Conform Actions Under General Conformity Rule*, which states that a proposed terminal/concourse expansion project is presumed to conform up to the square foot additions (footprint) of the project as determined by the most limiting pollutant.⁹

The hangar and COB demolition, as well as the National Hall construction actions, are separate activities and would not fall under the PTC for the new terminal and concourse upgrades; however, air emissions associated with these activities were evaluated under the general conformity applicability analysis. As a conservative assumption, all construction-related activity, including PTC and other activities outside of the PTC actions, were evaluated and summarized for general conformity applicability.

The applicability analysis was based on the emissions inventories presented above. The differences in PM_{2.5}, VOC, NO_x, and CO emissions under the Proposed Action and the No Action Alternative were computed and compared against applicable *de minimis* thresholds.

Table 5-5 presents the net change in construction and demolition-related emissions for 2016 to 2022 resulting from the implementation of the Proposed Action and a comparison of those emissions with the *de minimis* thresholds. The net change in emissions for 2016 to 2022 would be below established *de minimis* thresholds. A general conformity determination is not required for the Proposed Action. No adverse air quality impacts would be expected to result from implementation of the Proposed Action.

⁸ Following standard industry practice, the presence of ozone was evaluated by evaluating emissions of VOC and NO_x, which are precursors in the formation of ozone.

⁹ Federal Register, vol. 72, no. 145, p. 41565, July 30, 2007.
http://www.faa.gov/airports/resources/publications/federal_register_notices/media/environmental_72fr41576.pdf (accessed July 2015).

Table 5-4: Presumed to Conform Limits for Selected Projects

NONATTAINMENT AREA CLASSIFICATIONS				PRESUMED TO CONFORM AIRPORT PROJECTS				
				PAVEMENT MARKINGS (GALLONS) ^{1/}	TERMINAL UPGRADES (FT ²)	COMMERCIAL VEHICLE STAGING AREAS (FT ²)	NEW AIRFIELD WORK (NON-RUNWAY) (FT ²)	
CLASSIFICATION CHARACTERISTICS AND POLLUTANT			TONS PER YEAR					
Ozone ^{2/}	Serious	NO _x	50	5,235,194	92,945	1,123,179	1,096,929	
		VOC	50	109,455	770,658	11,939,754	11,916,560	
	Severe	NO _x	25	2,617,596	46,473	561,584	548,453	
		VOC	25	54,727	385,329	5,969,817	5,958,160	
	Extreme	NO _x	10	1,047,033	18,589	224,626	219,368	
		VOC	10	21,890	154,132	2,387,855	2,383,112	
	Marginal & Moderate	Inside OTR	NO_x	100	10,470,384	185,891	2,246,370	2,193,881
			VOC	50	109,455	770,658	11,939,754	11,916,560
		Outside OTR	NO _x	100	10,470,384	185,891	2,246,370	2,193,881
			VOC	100	218,911	1,541,316	23,879,629	23,833,359
CO			100	5,612,654	350,565	6,112,122	6,669,263	
SO ₂			100	176,376,634	1,805,687	24,233,530	23,682,564	
NO ₂			100	13,960,500	185,891	2,995,159	2,925,175	
PM ₁₀	Moderate		100	134,668,450	1,698,110	26,042,637	26,050,568	
	Serious		70	94,267,915	1,188,677	18,229,806	18,235,280	
PM _{2.5}			100	134,668,450	1,698,110	26,042,637	26,050,568	

NOTE: OTR = Ozone Transport Region

1/ Maximum annual volume of paint necessary to reach de minimis thresholds accounts for construction emissions

2/ Thresholds applicable to the Proposed Action are shown in bold text

SOURCE: Federal Register, vol. 72, no. 145, p. 41565, July 30, 2007.

PREPARED BY: Ricondo & Associates, Inc. April 2016.

Table 5-5: General Conformity Applicability Analysis

	RELEVANT CRITERIA POLLUTANT EMISSIONS (TONS PER YEAR)			
	CO	VOC	NO _x	PM _{2.5}
2016				
Net Change in Emissions—Proposed Action	0.1876	0.0623	0.7300	0.8366
<i>De minimis</i> threshold	100.000	50.0	100.000	100.000
Are emissions below <i>de minimis</i> threshold?	Yes	Yes	Yes	Yes
2017				
Net Change in Emissions—Proposed Action	1.6384	0.4265	5.7043	3.7585
<i>De minimis</i> threshold	100.000	50.0	100.000	100.000
Are emissions below <i>de minimis</i> threshold?	Yes	Yes	Yes	Yes
2018				
Net Change in Emissions—Proposed Action	2.9538	0.8705	12.2491	4.6417
<i>De minimis</i> threshold	100.000	50.0	100.000	100.000
Are emissions below <i>de minimis</i> threshold?	Yes	Yes	Yes	Yes
2019				
Net Change in Emissions—Proposed Action	0.6146	0.2473	1.6258	2.6099
<i>De minimis</i> threshold	100.000	50.0	100.000	100.000
Are emissions below <i>de minimis</i> threshold?	Yes	Yes	Yes	Yes
2020				
Net Change in Emissions—Proposed Action	0.2528	0.3956	0.5848	2.6139
<i>De minimis</i> threshold	100.000	50.0	100.000	100.000
Are emissions below <i>de minimis</i> threshold?	Yes	Yes	Yes	Yes
2021				
Net Change in Emissions—Proposed Action	0.2148	0.3955	0.2994	1.7551
<i>De minimis</i> threshold	100.000	50.0	100.000	100.000
Are emissions below <i>de minimis</i> threshold?	Yes	Yes	Yes	Yes
2022^{1/}				
Net Change in Emissions—Proposed Action	0.2148	0.3955	0.2994	1.7551
<i>De minimis</i> threshold	100.000	50.0	100.000	100.000
Are emissions below <i>de minimis</i> threshold?	Yes	Yes	Yes	Yes

NOTE:

1/ Emissions for 2022 were assumed to be the same as 2021, since construction activity is expected to be similar. This was a conservative assumption in that EPA vehicle and fuel regulations are expected to result in lower emissions from year to year due to cleaner engine standards and fleet turnover.

SOURCE: HMMH, December 2015, based on the results of the construction emissions analyses documented in Appendix F.

PREPARED BY: HMMH, January 2016.

5.2.2.2 2023 Operational Impact Potential

As compared to the No Action Alternative, the operation of the Proposed Action would not increase the number of forecast aircraft operations by time of day, aircraft type, or stage length. Once in operation, the aircraft emissions would be the same for the Proposed Action and the No Action Alternative. It should be noted as part of the Proposed Action, a new taxiway would be built (e.g., New N2) to allow efficient movement of the aircraft from the runway to the new concourse gate locations. This new taxiway would replace the existing taxiway, and the distance the aircraft would travel to and from the NNC would essentially be the same as the No Action Alternative. Therefore, aircraft emissions associated with the new taxiway were assumed to be the same for the Proposed Action and the No Action Alternative.

Heating, ventilation, and air conditioning (HVAC) for the airport are provided by the Central Utility Plant (CUP). To meet the additional cooling demand for the NNC, upgrades would be required at the CUP. It is anticipated that a new electric-driven 900 ton chiller would be installed at the CUP to provide additional cooling needs to the NNC. Additional heating needs for the new concourse would be well below the available capacity at the Central Plant; therefore, no additional heating upgrades or modifications are needed at the plant. Any new equipment would conform to local, state, and federal requirements. New HVAC systems, in addition to upgrades to existing systems, are "presumed to conform" under Category 7 of the FAA *Federal Presumed to Conform Actions Under General Conformity*.¹⁰

In summary, airport operational emissions (e.g., emissions from aircraft, ground support equipment, and motor vehicles) are anticipated to be essentially the same under the Proposed Action and the No Action Alternative during and after the construction period. Any change in emissions would occur from the Proposed Action and would be less than significant. Similarly, any new emissions associated with the CUP and new HVAC systems after the construction period would also be negligible and less than significant. The Proposed Action would not be expected to cause or contribute to exceedances of the NAAQS.

5.2.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, there would be no change to the aircraft operational characteristics and no construction of new facilities. The No Action Alternative would not adversely affect air quality.

5.3 Biological Resources

5.3.1 METHODOLOGY

The information gathered during the inventory of resources, and through consultation with the VDCR, VDACS, and the U.S. Fish and Wildlife Service (FWS), regarding the occurrence of plant and animal species and

¹⁰ Federal Register, vol. 72, no. 145, p. 41565, July 30, 2007.

http://www.faa.gov/airports/resources/publications/federal_register_notices/media/environmental_72fr41576.pdf (accessed July 2015).

associated habitat was compared to the LOPD to identify any potential impacts to fish, wildlife, and plant species and their associated habitats.

5.3.2 PROPOSED ACTION

5.3.2.1 Fish, Plants, and Wildlife

The existing habitats for fish, wildlife, and plants within the affected environment are discussed in Section 4.4.1.

2016 to 2022 Construction Impact Potential

As a result of the existing operational use of Airport property, and the transient nature of any species that would use the habitats within or near the LOPD, construction activities may result in only a temporary disruption, if any, of any wildlife activities.

2023 Operational Impact Potential

The Proposed Action would be restricted to a previously disturbed area at the Airport and would result in the removal and replacement of existing impervious services, as well as an increase in the impervious surface area within the LOPD by 305 square feet (0.007 acres). The Proposed Action would not cause changes in aircraft approach and departure profiles (i.e., the aircraft's height above ground) and would not affect the use of off-Airport habitat resources (including Roaches Run Waterfowl Sanctuary) by species known to exist or visit the area. Because of the location and extent of the proposed improvements, the existing operational use of Airport property, and the transient nature of any species that would possibly use the habitats near the LOPD, no wildlife would be affected by the Proposed Action. Additionally, there would be no taking or relocation of species, and there would be no loss of critical terrestrial or aquatic habitat. There are no commercial fishery activities near the Airport. Impacts to fish, wildlife, or plants and their associated habitats would not occur.

As described in Section 5.14.1, the Proposed Action would not affect water quality, and all stormwater management controls would be designed and implemented in accordance with state and local regulations for controlling pollution. There would be no significant impact to fish, plants, or wildlife as a result of operation of the Proposed Action, and no mitigation measures would be required.

5.3.2.2 Federally Protected Species, Critical Habitat, and Essential Fish Habitat

Federally listed species are discussed in Section 4.4.2 and included in Table 4-3. Of the federally listed species, only bald eagle has been confirmed at the Airport. Neither construction nor operation of the Proposed Action would affect federally listed species, including rare, threatened, or endangered species; species of concern; or Species of Greatest Conservation Need. Neither the Proposed Action nor the No Action Alternative would significantly impact federally protected species, and no mitigation measures would be required. The Authority prepared an updated FWS species list and Self-Certification letter certifying that no critical habitat or threatened and endangered species would be adversely effected by the Proposed Action. The species list and Self-Certification Letter are included in Appendix G.

5.3.2.3 State-Protected Species

State-listed species are discussed in Section 4.4.3 and included in Table 4-5. None of the listed species are known to exist on or near the Airport. Given the nature of the project, and the lacking presence of listed species in the project area, neither the construction nor the operation of the Proposed Project would adversely affect state-protected species. Under a Memorandum of Agreement established between the VDACS and the VDCR, the VDCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. VDCR stated in a letter dated May 22, 2015 that due to the scope of the activity and the distance to the resources, they do not anticipate that this project would adversely impact natural heritage resources (see Appendix B). After review of the Draft EA, VDCR concluded in a July 29, 2016 letter that the Proposed Action will not affect any documented state-listed plants or insects (see Appendix G). Mitigation measures would not be required. However, the Authority would implement and adhere to applicable state and local erosion and sediment control and stormwater management laws and regulations as further described in Section 5.14.1.3, Surface Waters and Groundwater.

5.3.3 NO ACTION ALTERNATIVE

None of the improvements included in the Proposed Action would occur under the No Action Alternative. Therefore, no species or habitats, protected or otherwise, would be lost or relocated. Impacts to fish, wildlife, or plants and their associated habitats would not occur.

5.4 Climate

Of growing concern is the impact of proposed projects on climate change. Greenhouse gases are those that trap heat in the earth's atmosphere. Both naturally occurring and anthropogenic (manmade) greenhouse gases include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆). This section presents a summary discussion of greenhouse gases and climate, as they relate to the Proposed Action and the No Action Alternative.

5.4.1 METHODOLOGY

In December 2014, CEQ issued a revised draft of NEPA guidance for considering the effects of climate change and GHG emissions. The draft CEQ guidance recommended consideration of: (1) the potential effects of a proposed action or its alternatives on climate change as indicated by its GHG emissions, and (2) the implications of climate change for the environmental effects of a proposed action or alternatives.¹¹

Although there are no federal standards for aviation-related greenhouse gas emissions, it is well-established that greenhouse gas emissions can affect climate.¹² As noted by CEQ, "It is not currently useful for the NEPA

¹¹ DOT, FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, July 2015.

¹² *Massachusetts v. EPA*, 549 U.S. 497, 508-10, 521-23 (2007).

analysis to attempt to link specific climatological changes, or the environmental impacts thereof, to the particular project or emissions, as such direct linkage is difficult to isolate and to understand.”¹³

The FAA issued guidance memorandums describing how and when GHG emissions should be quantified for FAA NEPA reviews.¹⁴ Most recently, FAA Order 1050.1F revised and reorganized environmental impact and policy procedures for implementing NEPA, including addressing climate impacts.¹⁵ The *1050.1F Desk Reference* provides guidance on how to address climate impacts in a NEPA document.¹⁶ Section 3.3.1 of the *Desk Reference* describes how and when GHG emissions should be quantified for NEPA reviews. The analysis must consider the potential incremental change in CO₂ emissions that would result from the Proposed Action and alternative(s) compared to the No Action Alternative. The comparison can be qualitative or quantitative. Consistent with the FAA guidance on considering greenhouse gases and climate under NEPA, the emissions associated with the construction and demolition equipment were qualitatively evaluated and compared to U.S. and global levels.

5.4.2 PROPOSED ACTION

5.4.2.1 2016 to 2022 Construction Impact Potential

Construction and demolition activities associated with the new concourse could result in a temporary increase in equipment usage. Research has shown that there is a direct relationship between greenhouse gas emissions and the diesel fuel and gasoline consumption of construction equipment and supporting truck and vehicle trips. A temporary increase in GHG emissions associated with construction and demolition activities is expected from gasoline and diesel fuel usage. Currently, there are no significance thresholds for aviation GHG emissions. Additionally, the FAA has not identified any factors to consider when making a significance determination for GHG emissions.¹⁷ As shown in Section 5.2.2, construction and demolition-related emissions under the Proposed Action would not exceed applicable *de minimis* thresholds and would not be regionally

¹³ Nancy H. Sutley, Chair, Council on Environmental Quality, Memorandum for Heads of Federal Departments and Agencies, *Subject: Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions*, February 18, 2010, http://ceq.hss.doe.gov/nepa/regs/Consideration_of_Effects_of_GHG_Draft_NEPA_Guidance_FINAL_02182010.pdf, (accessed February 21, 2012).

¹⁴ DOT, FAA Order 1051.E, Change 1, Guidance Memo #3, *Considering Greenhouse Gases and Climate Under the National Environmental Policy Act (NEPA): Interim Guidance*, January 12, 2012. It is the third in a series of memos to provide additional guidance on FAA’s NEPA requirements, procedures, and practices.

¹⁵ DOT, FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, July 2015.

¹⁶ DOT, FAA, *1050.1F Desk Reference*, July 2015.

¹⁷ DOT, FAA, *1050.1F Desk Reference*, July 2015.

significant. Similarly, any greenhouse gas emission increases from construction activity would comprise a very small fraction of the U.S.-based emissions of 6,673 million metric tons of carbon equivalents and an even smaller amount than the 49 gigatons of carbon dioxide-equivalent global GHG emissions.^{18, 19}

5.4.2.2 2023 Operational Impact Potential

The Proposed Action would not increase fuel consumption, and fuel burn was not quantitatively computed in the NEPA analysis, but it is discussed qualitatively. The Proposed Action would not increase fuel burn GHG emissions over the No Action Alternative, since the Proposed Action would not change the aircraft type or operations relative to the No Action Alternative. Therefore, the Proposed Action is not expected to change aircraft fuel consumption or the production of GHG from aircraft operations. As part of the Proposed Action, a new taxiway would be built (i.e., N2) to allow efficient movement of the aircraft from the runway to the new concourse gate locations. This new taxiway would replace the existing taxiway, and the distance the aircraft would travel to and from the new concourse would essentially be the same as the No Action Alternative. Therefore, aircraft greenhouse gas emissions associated with the new taxiway are assumed to be the same for the Proposed Action and the No Action Alternative. Mitigation measures would not be required.

5.4.3 NO ACTION ALTERNATIVE

The No Action Alternative would not result in increases in fuel burn or GHG emissions. No changes to GHG emissions would occur, and there would be no impact as a result of implementation of the No Action Alternative.

5.5 Coastal Resources

The coastal resources within the affected environment are discussed in Section 4.6.3 of this EA, which states that no coastal barrier resources exist within the vicinity of the Proposed Action. Development at the Airport must be evaluated with consideration of potential impacts on coastal zones and also be consistent with approved state plans and pursuant to the Coastal Zone Management Act.

5.5.1 METHODOLOGY

The information and data regarding the locations of coastal resources gathered from the various resource management agencies were mapped and compared with the LOPD for the Proposed Action in order to identify potential impacts to any coastal resources.

¹⁸ EPA, *U.S. Greenhouse Gas Inventory Report: 1990-2013*, <http://www.epa.gov/climatechange/ghgemissions/usinventoryreport.html> (accessed January 25, 2016).

¹⁹ IPCC, *IPCC Fourth Assessment Report: Climate Change 2007*, http://www.ipcc.ch/publications_and_data/ar4/wg3/en/spmssp-b.html (accessed January 25, 2016).

5.5.2 PROPOSED ACTION

The Authority certifies that the Proposed Action complies with the enforceable policies of the Virginia Coastal Zone Management (CZM) Program. In a letter dated April 28, 2015 (please see Appendix B), the VDEQ indicated no issues or concerns with coastal resources and indicated that their preference was to issue a CZM finding as part of the NEPA process, as opposed to an independent review. Therefore, concurrence was sought from the Commonwealth of Virginia in coordination with the publication of the Final EA. Concurrence from VDEQ was received in a letter dated September 15, 2016. The letter of concurrence is included in Appendix G. The following subsections describe the potential impacts on the resources governed under the nine enforceable programs of the Virginia CZM Program and the rationale for this conclusion. At this time, the District of Columbia does not have a commensurate CZM Program.

Fisheries Management

The LOPD for the Proposed Action is entirely on land within the Airport boundary. The Potomac River is under the jurisdiction of the District of Columbia and, therefore, is not regulated by the Virginia CZM Program. The potential impacts to fish species are discussed in Section 5.3.1 and summarized below:

- There are no commercial fishery activities near the Airport.
- No rare, threatened, or endangered species; species of concern; or Species of Greatest Conservation Need would be affected by the Proposed Action.
- There would be no taking or relocation of species.
- There would be no loss of critical terrestrial or aquatic habitat.
- There would be no changes in aircraft approach and departure profiles associated with the Proposed Action that would affect the use of off-Airport habitat resources (including Roaches Run Waterfowl Sanctuary) by species known to exist or visit the area.
- As described in Section 5.14.3, the Proposed Action would not affect water quality, and all stormwater management controls would be designed and implemented in accordance with state and local regulations for controlling pollution.

Subaqueous Lands Management

There are no Commonwealth-owned river bottomlands within the LOPD. Managed by the Virginia Marine Resources Commission (VMRC), the subaqueous lands management program does, however, provide VMRC with the ability to exert regulatory authority over any structures built in the Potomac River appurtenant to the shore of the Commonwealth. The Proposed Action does not include construction or operation of any structures built in the Potomac River appurtenant to the shore of the Commonwealth.

Wetlands Management

The potential impacts to wetlands and WOTUS are discussed in Section 5.14.1 of this EA. No vegetated wetlands or other WOTUS regulated by the U.S. ACE, VDEQ, or VMRC are located on Airport land within the LOPD.

Dunes Management

No primary dunes are located within or near the LOPD. Arlington County is not covered by Virginia's Coastal Primary Sand Dune Act. The Proposed Action would not impact jurisdictional dune resources.

Non-Point-Source Water Pollution Control

As discussed in Section 5.14.1 of this EA, the Proposed Action is unlikely to have adverse permanent impacts on water quality, because the total amount of any contaminants to be controlled in the runoff from new impervious surfaces is nominal. The Authority's design and construction program would require erosion and sediment control measures in accordance with NPDES regulations, and all necessary erosion and sediment control and pollution prevention measures would be implemented prior to beginning each element of construction. The Proposed Action would be constructed in accordance with all applicable permits, including the Virginia Pollutant Discharge Elimination System Permit as administered by VDEQ and the Airport's existing Multi-Sector General Permit (MSGP).

With the closest groundwater recharge area located west of I-395, near Arlington National Cemetery, the Proposed Action would have no adverse effect on groundwater resources.

Point-Source Water Pollution Control

In terms of point-source water pollution control, the EPA manages the overall NPDES program and regulates point-source stormwater discharges from the Airport into the Potomac River, Roaches Run, and Four Mile Run. All operational activities conducted by the Authority at the Airport are managed in accordance with the provisions and requirements of the Airport's existing MSGP. As part of this permit, the Authority maintains a Stormwater Pollution Prevention Plan (SWPPP). In addition to the Airport's permit, each Airport tenant conducting industrial activities covered by MSGP has an individual permit and associated SWPPP.

The redevelopment of existing impervious surfaces and the proposed additional impervious surfaces would be designed to manage stormwater runoff in accordance with the storage and pre- and post-flow requirements of the Virginia Stormwater Management Program (VSMP), the guidance in FAA AC 150/5320-5C, *Surface Drainage Design* (or current version), and the Virginia BMP Clearinghouse.

Shoreline Sanitation

No septic tanks are located in the vicinity of the Proposed Action, and the Proposed Action would not include the installation of any new or relocated septic tanks.

Air Pollution Control

The Proposed Action would not create a new point source of air pollutant emissions or modify an existing point source. Potential air quality impacts are discussed in Section 5.2 of this EA. Aircraft and aircraft support vehicle emissions are expected to be the same under the Proposed Action and the No Action Alternative. The net change in emissions resulting from construction activities would not equal or exceed established *de minimis* thresholds and would not be considered regionally significant. Adverse air quality impacts are not expected to result from implementation of the Proposed Action.

Coastal Lands Management

As reported in Section 4.6.2, under the Federal Coastal Zone Management Act of 1972 (CZMA), each state is encouraged “to exercise effectively their responsibilities in the coastal zone through the development and implementation of management programs to achieve wise use of the land and water resources of the coastal zone, giving full consideration to ecological, cultural, historic, and esthetic values as well as the needs for compatible economic development.”²⁰ Under the Chesapeake Bay Preservation Act (CBPA) and the Arlington County Chesapeake Bay Preservation Ordinance, all of Arlington County is classified as a Resource Management Area (RMA). The LOPD does not lie within 100 feet of the mean high-water mark of the Potomac River and would not be considered, by definition, as being within a Resource Protection Area (RPA). The Proposed Action would be designed and constructed in accordance with the erosion, sediment, stormwater quality controls, and pollutant prevention practices required by applicable regulations and permit requirements.²¹

5.5.3 NO ACTION ALTERNATIVE

None of the improvements included in the Proposed Action would be constructed under the No Action Alternative. All potential effects from existing and future Airport operations would be managed as required by the Airport’s existing NPDES permit and SWPPP. Therefore, no impacts to coastal resources would occur as a result of the No Action Alternative.

5.6 Department of Transportation Act Section 4(f)

Per Section 4(f) of the DOT Act, as discussed in Section 4.7.1 of this EA, the FAA may approve a project requiring the use of public land or a historic site of national, state, or local significance only if: (1) there is no prudent and feasible alternative to using that land, and (2) the project includes all possible planning to minimize harm to the land or historic site resulting from the use.

It was also examined as to whether or not there would be a change in the use of a recreational park or facility funded through the Department of the Interior’s Land and Water Conservation Fund (LWCF) Act. If a change from a recreational to a non-recreational use were to occur, then it would be considered a “conversion” under the LWCF Act. Section 6(f) properties were considered in the same manner as Section 4(f) properties. There are no Section 6(f) properties on or adjacent to DCA.

Both direct and indirect adverse impacts to Section 4(f) properties were considered. Direct impacts include any physical taking of the property. Indirect adverse impacts, such as noise, which conflict with the public use of Section 4(f) properties or adversely affect the context of historic sites, would be considered a constructive

²⁰ *Coastal Zone Management Act of 1972* (16 USC §1452).

²¹ Arlington County, Chesapeake Bay Preservation Ordinance, Section 61-10, *General Performance Standards for Development in Chesapeake Bay Preservation Areas*, as amended February 8, 2003.

use or taking of the property, if normal activities of the property are incompatible with FAA guidelines on noise and land use.

Parks, recreational areas, wildlife refuges, and historic sites are classes of land use that may be noise-sensitive, depending upon the specific use of the site. Sites that might be substantially impaired by excessive noise are amphitheaters, campgrounds, or other areas where a quiet setting is a significant attribute of the resource.

5.6.1 METHODOLOGY

Public lands near the Airport were documented through a review of applicable plans and maps. The information gathered during the inventory of resources, and information from the National Park Service (NPS), was used to identify potential impacts to any Section 4(f) or Section 6(f) lands. An initial assessment was made to determine whether the Proposed Action would result in the use of any property to which Section 4(f) applies. A Section 4(f) use would occur if the Proposed Action would involve an actual physical taking of a Section 4(f) property. A physical taking includes the alteration of structure of facilities on the Section 4(f) property. A Section 4(f) use would also occur if the Proposed Action would involve a constructive use on the Section 4(f) property. A constructive use would occur if the impacts of the project on the Section 4(f) property are so severe that the activities, features, or attributes that qualify the property for protection are substantially impaired.

According to FAA Order 1050.1F, a significant impact would occur to Section 4(f) or Section 6(f) lands when:

- The action involves more than a minimal physical use of a resource, or
- Constitutes a “constructive use” based on an FAA determination that the project would substantially impair the resource.

The implications of impacts to historic resources, which are also considered Section 4(f) resources, are addressed in 5.6.2, while the impacts considered under Section 106 of the Historic Preservation Act are discussed in Section 5.8, “Historic, Archaeological, Architectural, and Cultural Resources.”

5.6.2 PROPOSED ACTION

2016 to 2022 Construction Impact Potential

The Airport is bordered to the north and west by publicly owned parks, recreation areas, and a wildlife/waterfowl refuge. Public lands are also located east of the Airport, across the Potomac River. Public lands near the Airport include the GWMP, Gravelly Point, Roaches Run Waterfowl Sanctuary, Long Bridge Park, Mount Vernon Trail, Daingerfield Island, and East Potomac Park. None of these public lands was purchased with Section 6(f) LWCF program funds. There are no national forests, wilderness areas, or wild and scenic rivers on or adjacent to the Airport.

As part of the construction phasing for the Proposed Action, Lot K in the northernmost portion of the LOPD would temporarily be used to provide post-security operational space for aircraft ground service equipment (GSE) storage during construction. Temporarily closing Lot K would require temporary relocation of the

airport security fence to the outside of Lot K. The closure of Lot K would require the temporary closure of a sidewalk that provides direct access to the Mount Vernon Trail. This sidewalk was constructed by the Airport and is located entirely on airport property. There is no public parking available in Lot K, and the tenants of Hangar 11, Hangar 12, and the COB for whom the trail connection was constructed would be relocated prior to the closure of Lot K. During the time that the sidewalk connector would be closed, there would be no need for trail access at this location, as Lot K would also be temporarily closed, Hangar 11, Hangar 12, and the COB tenants would have been relocated and the buildings demolished.

There would be no impact to the Mount Vernon Trail or trail users from the temporary closure of this sidewalk access point. Once construction is complete, and the New North Concourse is operational, the airport security fence would be relocated, Lot K would be returned to a landside parking area, and the sidewalk access point to the Mount Vernon Trail reopened. Because there would be no one to access the Mount Vernon Trail from this location during the construction activities, and this access point is not currently open to the general public, the temporary closure does not rise to the level of "use" as defined by DOT Section 4(f).

The Proposed Action would not require the temporary use of any Section 4(f) resources during construction, and no construction easements would be needed. The Proposed Action would not have Section 4(f) impacts during construction.

2023 Operational Impact PotentialThe Proposed Action would be located entirely on Airport property within a developed airport area surrounded by the existing terminal, airfield pavement, buildings, taxiways, roadways, and other airport uses. As described in Section 4.9.3, no historic, archaeological, architectural, or cultural resources are located within the LOPD of the NNC and Secure National Hall. However, renovations to the South Hangar Line (Hangars 2 through 6) to accommodate tenants currently housed in Hangar 11 would be required, as well as minor renovations to Terminal A to create additional conference room and office space in currently undeveloped floors of the historic Main Terminal building. The South Hangar Line and Terminal A are listed on the NRHP; therefore, they are Section 4(f) properties. The proposed improvements would comprise interior building modifications only, and they would not impact the exterior of either resource. The Proposed Action would be consistent with the Airport's other features, and it would not visually impact views from, or the view of, the South Hangar Line or Terminal A. The SHPO has issued a conditional Section 106 finding of No Adverse Effect (see Appendix B), pending their continued consultation on the design of the new facilities. The physical renovation to the South Hangar Line and Terminal A would be a minimal physical use and qualify as a *de minimis* impact.

As described in Section 5.11.2, the Proposed Action would not result in increased aircraft activity. Therefore, there would be no change to indirect noise impacts at parks or other recreational areas located under the DCA flight paths, such as at the Roaches Run Wildlife Sanctuary, Long Bridge Park, or Gravelly Point. Any change in aircraft operations on the ground at DCA associated with the Proposed Action would not affect the use or operation of any publicly owned resources near the Airport.

Similarly, for the reasons described in Section 5.13.2, the Proposed Action would not significantly affect views at Gravelly Point, Long Bridge Park, the Roaches Run Wildlife Sanctuary, the Mount Vernon Trail, the GWMP, or other areas where scenic views contribute substantially to the recreational experience.

5.6.3 NO ACTION ALTERNATIVE

None of the improvements included in the Proposed Action would be constructed under the No Action Alternative. There would be no actions at the Airport that would induce growth or otherwise affect the demand for recreational resources. Therefore, no impacts to Section 4(f) or Section 6(f) resources would occur under the No Action Alternative.

5.7 Hazardous Materials, Solid Waste, and Pollution Prevention

The presence of hazardous materials and the disposal of solid waste within the affected environment is discussed in Sections 4.8.1 and 4.8.2, respectively, of this EA.

5.7.1 METHODOLOGY

The information on known hazardous material sites at the Airport, as described in Section 4.8.1, was compared to the LOPD for the Proposed Action to identify the potential of known contaminants to be disturbed and dispersed further into the environment.

5.7.2 PROPOSED ACTION

5.7.2.1 2016 to 2022 Construction Impact Potential

Site preparation activities associated with the construction of the Proposed Action (e.g., demolition of the COB and Hangars 11 and 12; the NNC; the replacement of Hangar 12; associated airfield pavements) would have the potential to disturb petroleum-contaminated soil and groundwater within the LOPD. As a conservative estimate, all soil removed from the site was assumed to be contaminated to some degree. The contaminated soil, estimated to be 179,300 cubic yards (cy), would be excavated, loaded onto trucks, and transported and disposed at Soil Safe Incorporated (Soil Safe) in Brandywine, Maryland, or a comparable facility.²² It is assumed that this facility would also provide clean fill for placement during redevelopment operations.²³ All material excavated from within the Project Area would be tested prior to disposal. Any material found to be hazardous would be transported and disposed of in accordance with federal, state, and local requirements, including:

- Management of hazardous waste (49 USC § 260-280)
- Transportation of hazardous waste (49 USC § 171-199)
- Virginia Hazardous Waste Management Regulations (9 VAC § 20-60)
- Virginia Regulations Governing the Transportation of Hazardous Materials (9 VAC § 20-110)

²² Peter Rigby (Paciulli, Simmons, & Associates), in discussion with Stephen Muench (Ricondo & Associates, Inc.), April 7, 2015.

²³ Erik Schwenke (MWAA), "Terminal B/C Redevelopment construction," email to Virginia Jackson (Ricondo & Associates, Inc.), May 13, 2015.

Hangars 11 and 12 may contain asbestos, lead paint, PCB-containing light ballasts, and/or mercury containing switches. The fire doors in the Authority's COB are assumed to contain asbestos. The visually inspected light ballasts in the COB were marked with labels stating "No PCBs." Prior to disposal, all light ballasts need to be visually inspected for the "No PCBs" label during demolition activities.

Demolition of these facilities would disturb these building materials contained within these structures. Demolition would proceed, following abatement activities where applicable (e.g., abatement of asbestos-containing materials [ACM]). All demolition material would be disposed of off-Airport at licensed facilities that accept these specific wastes, and material would be confirmed prior to disposal. Any material found to be hazardous would be transported and disposed of in accordance with federal and state requirements, including:

- Identification and Listing of Hazardous Materials (40 USC § 261)
- Virginia Solid Waste Management Regulations (asbestos abatement) (9 VAC § 20-80-640)
- Virginia Solid Waste Management Regulations (9 VAC § 20-60-261)

As noted in previous reports, the Authority indicated that each ballast would need to be individually inspected for "No PCBs" labeling during demolition activities.²⁴ ²⁵ Over 1,200 ballasts were estimated and would be inspected as part of the hangar demolition. An additional number of ballasts would be expected as part of the demolition of the COB.

Building demolition involving lead-containing components is regulated by the Occupational Health and Safety Act (OSHA). Contractors performing the work would be properly trained and notified with regards to the materials containing lead.²⁶ Lead-containing materials would be disposed in accordance with 40 USC § 261, *Identification and Listing of Hazardous Waste* following characterization through a "toxicity characteristic leaching procedure." As previously noted, equipment with the potential to contain PCBs and mercury would be individually inspected for their potential hazardous nature and properly disposed in accordance with federal, state, and local regulations.

There are no areas within the LOPD that are listed, or under consideration for listing, on the National Priorities List (NPL) established by the EPA, or that have been designated as Resource Conservation and Recovery Act (RCRA) Solid Waste Management Units (SWMUs). Therefore, the Proposed Action would have no impact on any NPL or SWMU sites.

There are no known USTs within the LOPD. In the event that previously unknown contaminants are discovered during construction of the Proposed Action, or in the event a spill occurs during construction of the Proposed Action, work in the area of the contaminants or spill would be stopped until the proper

²⁴ Applied Environmental, Inc., *Hazardous Materials Screening Survey – Hangar 11, Ronald Reagan National Airport*, June 23, 2014.

²⁵ Ibid.

²⁶ 29 CFR 1926.62, Lead.

reporting agency could be notified. In the event of a spill or a release to the ground, VDEQ would be notified. However, if the release or spill enters Four Mile Run, Roaches Run, or the Potomac, the National Response Center (NRC), District Department of Environment, and VDEQ would be notified. The NRC is the federal point-of-contact for receiving reports of releases of hazardous substances, which requires notification requirements under multiple laws.

Construction activities would generate solid waste. During construction, larger demolition debris would be disposed of at an appropriate construction and demolition debris landfill. Stockpiles and dumpsters would be located in the construction areas for proper on-site management of construction-generated solid waste. A contracted solid waste disposal company would haul the materials off-site for either land filling or by another appropriate disposal method.

The Authority's consultation with the EPA and state agencies (through the VDEQ, Office of Environmental Impact Review) was initiated on April 10, 2015 by letter of invitation to a scoping meeting at the Authority's offices on April 29, 2015. Copies of the consultation with federal and state agencies are included in Appendix B.

5.7.2.2 2023 Operational Impact Potential

The Proposed Action would not affect the use and/or storage of any regulated materials, as the activities in Hangars 11 and 12 would be moved elsewhere within the Airport. Operation of the Proposed Action improvements would likely result in a nominal increase of solid waste with the added concession areas for passengers. After the Proposed Action is operational, municipal solid waste would be collected for proper disposal by the airport solid waste disposal services contractor in place at the time. Operation of the Proposed Action would not significantly affect hazardous materials or solid waste, and no mitigation measures would be required.

5.7.2.3 Pollution Prevention

Pollution Prevention (P2) is managed by the Authority through various internal programs and primarily through the Municipal Separate Stormwater Sewer System (MS4). Post construction, operation of the new facilities would be subject to DCA's airport-wide SWPPP. The SWPPP includes guidance on the proper management of regulated materials and wastes to minimize the potential for them to impact stormwater and sensitive receptors. Topics include:

- management of hazardous materials and wastes
- storage including secondary containment
- good housekeeping practices
- communication actions and policies
- staff training
- record-keeping and regular reporting
- updates to the plan with operational changes

P2 is an integral part of operations at all Authority holdings. Management systems are in place and implemented throughout the Authority with specific staff with defined roles to manage P2 at DCA. In addition to the SWPPP requirements, the Authority has implemented a P2 Plan that minimizes the amount of materials utilized and wastes generated, while it increases the reuse and recycling of these materials. This program would be implemented during both construction and post-construction phases.

Construction activities would implement the reduction, reuse, and recycling concepts within pollution prevention that is in accordance with the Authority's program(s). Construction-specific spill response plans, and the inclusion of the construction activities into the SWPPP, or a construction-specific SWPPP, by the Authority would also address pollution prevention with regards to spills, releases, and stormwater.

There are no Commonwealth of Virginia regulations on the procurement of recycled or recyclable productions that pertain to the Proposed Action.

5.7.3 NO ACTION ALTERNATIVE

None of the improvements included in the Proposed Action would be constructed under the No Action Alternative. Existing levels of regulated materials would be utilized at the hangars, and regulated materials and solid wastes would be generated at similar levels to existing operations. No impacts associated with hazardous materials and solid waste would occur under the No Action Alternative.

5.8 Historical, Architectural, Archeological, and Cultural Resources

As described in Section 4.9.1, several federal and state programs document and strive to preserve resources deemed important to the historical context of localities, states, regions, or the nation. As the nation's capital, the Washington, D.C. metropolitan area contains many of these resources, including several on and near the Airport.

5.8.1 METHODOLOGY

The locations of documented historic, archaeological, architectural, and cultural resources were compared with the LOPD to identify any potential effects to those resources. The District of Columbia Historic Preservation Office and the Virginia Department of Historic Resources (VDHR) State Historic Preservation Office (SHPO) were contacted to identify any potential agency concerns relevant to the Proposed Action.

5.8.2 PROPOSED ACTION

5.8.2.1 2016 to 2022 Construction Impact

On-airport historic resources consist of structures and an archaeological site within the terminal and hangar areas. The nearest off-airport historic resource is the GWMP. As reported in Section 4.9.3, most of the Airport is located on fill, including the entire airfield and, therefore, has low potential to contain additional intact archaeological resources. Natural landforms that existed before the Airport was constructed are confined to

the western areas of Airport property. Some are under varying depths of fill and may contain intact archaeological remains. Of the natural landform, or original shoreline, only limited portions have not been disturbed for construction of Airport facilities. These limited areas are generally located in the area of the terminal complex west of the airfield. In general terms, the LOPD is located in areas with a low potential to contain intact archaeological remains and information, and the LOPD is contained entirely in areas with prior disturbance and/or approximately six feet of fill. The depth of construction of the Proposed Action is also approximately six feet. Considering that the peninsula on which the airfield was constructed is predominantly manmade, and the landside facilities are heavily developed, there is very little potential for any as-yet-unknown resources to be affected by construction of the Proposed Action.

The Proposed Action would require some of the current tenants at Hangar 11 (proposed to be demolished as part of the Proposed Action) to move to renovated facilities in the South Hangar Line. Likewise, some COB office functions may be relocated to vacant areas of the historic Terminal A, which will require renovation. The South Hangar Line and Terminal A are listed on the NRHP. The Authority will continue to coordinate with the SHPO on the proposed renovations for the South Hangar Line and the historic Terminal A. The modifications would be minor and would not result in more than a minimal physical use of the historic resources. Mitigation measures, if any, required by SHPO for the minor changes to these buildings would be implemented by the Authority. The SHPO has issued a conditional finding of No Adverse Effect to historic properties for the Proposed Action, which is conditioned on continued consultation with the SHPO as design of the new facilities progresses. The SHPO's conditional finding is included in Appendix B.

5.8.2.2 2023 Operational Impact Potential

The Proposed Action is consistent with development and land use of the Airport, and it would have no adverse visual effects on any nearby resources, including the Mount Vernon Trail, GWMP, Historic Terminal A, or the South Hangar Line (see Sections 5.6.2 and 5.13.2). According to the aircraft noise analysis (see Section 5.11.2), aircraft noise levels are not expected to change as a result of the Proposed Action; therefore, the eligible NRHP sites identified on Exhibit 4-5 would not be significantly affected by aircraft noise. The Proposed Action would not significantly affect historic, architectural, archeological, and cultural resources.

5.8.3 NO ACTION ALTERNATIVE

None of the improvements included in the Proposed Action would be constructed under the No Action Alternative. Therefore, no impacts to historic, archaeological, architectural, or cultural resources would occur under the No Action Alternative.

5.9 Land Use

5.9.1 METHODOLOGY

The existing land uses in the Airport environs are discussed in Section 4.10.2 and shown on Exhibit 4-6. The offsite land uses primarily consist of residential, commercial, institutional/governmental, and parks/recreation. The relevant local jurisdictions with land use plans include Arlington County, the City of Alexandria, and Fairfax

County in Virginia; Washington, D.C.; and Montgomery County and Prince George's County in Maryland. Each of these jurisdictions has a planning and zoning department that is responsible for developing and implementing its land-use plans. All jurisdictions participate in the Metropolitan Washington Council of Governments, which provides a forum for developing consistent regional land use, transportation, environmental, economic development, and other plans. Montgomery County and Prince George's County also participate in the Maryland-National Capital Park and Planning Commission, which further integrates their planning functions. Additionally, the analysis of compatible land use is based on a site reconnaissance of the surrounding communities that embody the Airport environs.

In accordance with FAA Order 1050.1F and the Airport Development Grant Program (49 USC 47101 et seq.), the Proposed Action is compatible with existing and future land uses if the following apply:

- Documentation is provided within the EA to support the Authority's assurance under 49 USC 47107(a)(10) of the 1982 Airport Act that appropriate action is being taken to the extent reasonable to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport; and,
- The Proposed Action or alternatives are consistent with plans (existing at the time the Proposed Action is approved) of public agencies for development of the area in which the airport is located 49 USC 47106(a)(10).

In addition to evaluating land use compatibility in relation to building-height obstructions, the proximities of landfills, wetlands, and wetland mitigation sites to the Airport were considered, as these land uses attract wildlife and can pose a hazard to aviation. Finally, the consistency of the Proposed Action with plans of public agencies—existing at the time this EA was prepared—for development of the area in which DCA is located was also evaluated.

In addition to aircraft noise, construction noise impacts were also considered in Section 5.11.2. The potential for impacts that have land use ramifications (e.g., disruption of communities, relocation, and induced socioeconomic impacts) is evaluated in Section 5.12.2.

5.9.2 PROPOSED ACTION

5.9.2.1 2016 to 2022 Construction Impact

CFR Title 14, *Aeronautics and Space*, Part 77.9, "Construction or Alteration Requiring Notice," requires the FAA be notified of planned structures taller than 200 feet or within 20,000 feet of an airport that exceed defined heights based on distance from the airport. The proposed developer is required to notify the FAA of the plans through the filing of FAA Form 7460, "Notice of Proposed Construction or Alteration." The replacement for Hangars 11 and 12 would be of similar height as the existing hangars. The NNC would be similar in height as the existing Terminal B/C concourses. Furthermore, the Proposed Action would not impact the elevations of existing or planned off-airport structures. The Authority would seek FAA approval for revisions to the ALP to reflect the final layout of the elements of the Proposed Action and would file FAA Form

7460 once the design progresses. As the new facilities would be similar in height to existing on-airport facilities, no impacts to navigable airspace would occur as a result of construction of the Proposed Action.

5.9.2.2 2023 Operational Impact Potential

The proposed redevelopment of Terminal B/C, including the Secure National Hall, NNC, and related improvements, would be located on Airport property owned by the federal government and operated by the Authority within and adjacent to existing Airport uses. The Airport is located within a developed, urban area. The Proposed Action's project site is surrounded by the existing terminal, airfield pavement, airport buildings, taxiways, roadways, and other airport uses. Given that this is an urban, airport area, the Proposed Action is not anticipated to create a significant impact on compatible land use. The Proposed Action is consistent with applicable land use plans, policies, and regulations. The Proposed Action would not require additional land acquisition, generate substantial off-airport land-use impacts, or otherwise influence land-use patterns or development in the vicinity of DCA.

As identified in Section 4.8.2.3, the nearest landfill is more than 18 miles from the Airport and would, therefore, not present a land-use compatibility concern. Also, as identified in Section 4.15.3, although the Airport is surrounded by water resources, these resources would not experience a significant impact under the Proposed Action compared to the No Action Alternative (see Section 5.14.1). Therefore, compatible land-use impacts resulting from the Proposed Action would not be considered significant, and no mitigation would be required.

5.9.3 NO ACTION ALTERNATIVE

There would be no change to the existing terminals and SSCPs with the No Action Alternative. Existing airport land uses would remain consistent with the land-use compatibility plans for areas near DCA. Therefore, no significant impacts to compatible land use would result from implementation of the No Action Alternative.

5.10 Natural Resources and Energy Supply

5.10.1 METHODOLOGY

The Proposed Action and the No Action Alternative were reviewed for their potential to place large demands on local existing or planned utilities, their need to use scarce or rare materials in construction, their potential to result in increased aircraft fuel consumption, and their potential to affect local or regional smart growth requirements.²⁷

²⁷ The smart growth movement promotes infrastructure investment and redevelopment of city centers to address economic and environmental concerns regarding urban sprawl development patterns (see www.smartgrowth.org for additional information on the smart growth movement).

5.10.2 PROPOSED ACTION

5.10.2.1 2016 to 2022 Construction Impact Potential

The Proposed Action would not require the use of scarce or rare materials for construction. Materials to be used for the major project elements generally include asphalt and concrete for the airfield pavement, and they would also include concrete, masonry, steel, and glass for the NNC and Secure National Hall, which are assumed to be readily available.

5.10.2.2 2023 Operational Impact Potential

The Proposed Action would not result in significant changes in taxiing distances of aircraft departing from and returning to the NNC. Therefore, increases in aircraft fuel consumption are not anticipated.

Future electrical demand associated with the Proposed Action is expected to be approximately 5,719 kVA. The total electrical load at the North Substation would be 15,044 kVA, which is well within the limits of the existing system capacity. The proposed improvements would not affect the South Substation, which is also operating well within the limits of the existing system capacity.

Future cooling demand associated with the Proposed Action is expected to be 7,943 MBh. The total demand on the chilling plant would be 53,914 MBh, which is approaching but within the 54,000 MBh capacity of the existing plant. To alleviate this demand, the proposed project would construct one additional chiller and provide upgrades to the existing units to increase their efficiency.

The Proposed Action would increase the natural gas demand for heating capacity by approximately 4,318 MBh. The increase in demand would still leave spare capacity to support the future demands of the Airport.

Given the existing energy and natural resources consumption of the Airport and the projected future demand, the Proposed Action would not have a significant effect on the energy and resource supplies of local utilities, and no mitigation measures would be required.

5.10.3 NO ACTION ALTERNATIVE

None of the improvements included in the Proposed Action would be constructed under the No Action Alternative. In the No Action Alternative, scarce or rare materials are not used, fuel consumption is not increased significantly, and electricity consumption would not increase. Therefore, impacts on natural resources or energy supply would not result from the No Action Alternative.

5.11 Noise and Noise-Compatible Land Use

5.11.1 METHODOLOGY

The noise analysis for this EA used the Federal Highway Administration's (FHWA) Roadway Construction Noise Model 1.1 to calculate the sound levels associated with construction equipment at the closest noise-sensitive

receptor locations with largely unobstructed views of the construction site, including residential, hotel, and park areas.²⁸

The noise analysis evaluated sound levels of construction activities associated with the Proposed Action. Construction sound levels are a function of the types of equipment being used, the number of each type of equipment, and the distances between the construction equipment and the sensitive receptor locations. Overall construction sound levels are governed primarily by the noisiest pieces of equipment operating at a given time. The Roadway Construction Noise Model contains both sound-level data from equipment specifications and actual sound-level measurements. The noise analysis employed the measured values for all equipment and used the default equipment usage factors from the model.

The type and units for each piece of equipment vary depending on the construction phase. During any particular activity, multiple pieces of equipment may operate simultaneously and for various durations throughout the construction period. **Table 5-6** presents the range of construction equipment units estimated to be used during the various construction phases, as well as the reference sound levels associated with the various types of construction equipment.

Table 5-6: Construction Equipment Scenarios

EQUIPMENT	USAGE FACTOR (PERCENT)	LMAX ^{1/} AT 50 FEET ^{2/}	RANGE OF UNITS PER DAY BY PHASE
Backhoe	40	78	0-3
Bulldozer	40	82	0-6
Compactor	20	83	1-3
Crane	16	81	0-2
Drilling Rig	20	84	0-1
Dump Truck	40	76	2-10
Excavator	40	81	0-3
Front End Loader	40	79	1-3
Generator	50	81	2-6
Hydraulic Hammer	10	90	0-3
Mixer	50	80	0-2
Motor Grader	40	85	0-2
Track Loader	40	79	0-6
Vibratory Roller	20	80	0-3
Pickup Truck	40	75	2-6
Paving Equipment	50	77	0-1
Concrete Saw	20	90	0-1

NOTES:

1/ Lmax: Maximum A-weighted sound level in decibels, dBA

2/ Reference sound-level data based on measured data

SOURCE: Federal Highway Administration, *Roadway Construction Noise Model, Version 1.1*, December 2008.

PREPARED BY: HMMH, July 2015.

²⁸ Federal Highway Administration, *FHWA Roadway Construction Noise Model: User's Guide*, FHWA-HEP-05-054, January 2006.

The construction noise study area includes off-airport areas of the District of Columbia and Arlington, Virginia that are in the vicinity of the construction site. The noise analysis identified five representative sensitive receptor locations in the study area. These sensitive receptors were evaluated for noise impacts resulting from construction activities associated with the Proposed Action. These receptor locations included:

- Location 1—Residence Inn Marriott Hotel—Crystal City, Virginia (approximately 4,200 feet from the construction site)
- Location 2—Crystal Place Apartments—Crystal City, Virginia (approximately 1,100 feet from the construction site)
- Location 3—Gravelly Point Park—Arlington, Virginia (approximately 2,800 feet from the construction site)
- Location 4—East Potomac Park—District of Columbia (approximately 6,000 feet from the construction site)
- Location 5—Riverside Condominium—District of Columbia (approximately 8,800 feet from the site)

These receptor locations were selected based on land-use considerations, and they represent the closest sensitive locations (residential and recreational uses) in the study area with generally unobstructed views of the construction site that may experience changes in sound levels due to the Proposed Action. **Exhibit 5-1** presents the receptor locations used in the noise analysis.

5.11.2 PROPOSED ACTION

5.11.2.1 2016 to 2022 Construction Impact Potential

Nighttime work would occur throughout the construction period, starting with the modifications to Historic Terminal A and the South Hangar Line in the fall of 2016, through construction of the Secure National Hall and the NNC, and ending in winter of 2022. Up to 35 percent of the modifications to Historic Terminal A and the South Hangar line could be performed at night. Activities would include large deliveries and hauling, utility work, and work in or adjacent to existing tenant and operational areas.

The peak period of nighttime construction work would occur during construction of the Secure National Hall from spring 2017 to June 2020. To minimize disruption of the terminal building and roadways during higher daytime activity levels, up to 70 percent of the work is forecast for the night. Activities would include large deliveries and hauling, construction of the two SSCPs, and all of the interior construction of Terminal B/C, which is required to connect the existing terminal to the new SSCP.

During the construction period from spring 2017 to winter 2022, the NNC would include nighttime construction periodically, approximately 30 to 40 percent. Activities would include large deliveries and hauling, utility work, structural demolition and modifications adjacent to existing tenant areas, work on the Air Operations Area, and construction of the tie-in to existing Terminal B/C.

These types of construction activities have the potential to cause noise and vibration in the existing Terminal B/C, tenant leaseholds, and the outdoors during both day and nighttime periods.



EXHIBIT 5-1



Construction Noise Sensitive Receptors

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5.11.2.2 Noise Criteria

Relevant construction noise limits are included in the Authority's 2014 *Design Manual*, Section 1.18, "Noise Control." The noise limits provided in the *Design Manual* are suggested to minimize disturbance to the airport neighbors. For this EA, these were used to establish criteria for evaluating whether or not the Proposed Action would generate sound levels that result in potential impacts at noise-sensitive locations. These construction noise criteria are as follows:

- Daytime (7 a.m. to 5 p.m.): A maximum sound level (Lmax) of 72 dBA
- Nighttime (5 p.m. to 7 a.m.): A maximum sound level (Lmax) of 55 dBA

The *Design Manual* recommends securing advance written approval from the Authority's Contracting Officer's Technical Representative prior to scheduling any activity that is anticipated to produce a sustained or repetitive noise level higher than the decibel limits indicated above.

5.11.2.3 Environmental Impacts

Project construction is expected to generate typical sound levels associated with construction activities, including the use of heavy equipment operations for demolition, material transport, and structural work. Heavy machinery would be used intermittently throughout construction, and these activities would occur during daytime, evening, and nighttime hours. The type of equipment and number of units of equipment would vary between the different construction phases. **Table 5-7** presents the projected range of sound levels associated with construction activities.

Table 5-7: Construction Equipment Sound Levels, dBA

RECEPTOR LOCATIONS	PROJECT SOUND LEVELS LMAX ^{1/}	EXCEEDS CRITERIA?	
		DAY	NIGHT
Location 1 - Residence Inn Marriott Hotel	46 - 52	NO	NO
Location 2 - Crystal Place Apartments	57 - 63	NO	YES ^{2/}
Location 3 - Gravelly Point Park	49 - 55	NO	NO
Location 4 - East Potomac Park	42 - 48	NO	NO
Location 5 - Riverside Condominium	39 - 45	NO	NO

NOTES:

1/ Maximum sound level, dBA (represents sound level of noisiest piece of equipment)

2/ The majority of the equipment falls within the criteria.

SOURCE: HMMH, July 2015.

PREPARED BY: HMMH, July 2015.

Except for nighttime construction noise anticipated at Location 2, representing the nearest residential locations in Crystal City, the projected construction noise levels at all receptor locations evaluated are below the construction noise criteria. At Location 2, the projected maximum noise levels are in the range of 57-63 dBA, which exceed the nighttime criterion (i.e., 55 dBA) during all construction phases. However, only one to three pieces of equipment during each phase would exceed the limit, and the analysis assumes no terrain, buildings, or vegetation between the source and the receiver. Between Location 2 and the project area are railroad tracks, the GWMP, an area of trees, and the terminal roadway system. All of these would help reduce the potential effect of the equipment noise on the community.

The Authority's 2014 *Design Manual* requires the coordination of noise and work-hour restrictions on a project-specific basis depending upon location, anticipated types of noise, times and frequency of occurrence, and local regulations. This analysis shows that if the loudest pieces of equipment were operating at night, without taking into account the mitigating factors of terrain, buildings, and vegetation that could serve as noise buffers, then they would have the potential to exceed the *Design Manual's* nighttime noise criterion of a Lmax of 55 dBA.

To prevent a construction noise impact from occurring, appropriate mitigation measures would be applied.

5.11.2.4 Construction Noise Mitigation

Construction noise mitigation measures would be required to avoid noise impacts at the nearest residential locations during the nighttime hours for the loudest pieces of equipment. During project design, more detailed estimates of construction noise would be carried out to develop an appropriate noise mitigation plan. Noise reduction methods may include, but are not limited to, the following:

- Attaching (1) intake and exhaust mufflers, shields, or shrouds, and (2) noise-deadening material to inside of hoppers, conveyor transfer points, or chutes
- Maintaining equipment mufflers and lubrication to prevent unnecessary noise
- Limiting (1) the number and duration of equipment idling on site; (2) the use of annunciators or public address systems; and, (3) the use of air or gasoline-driven hand tools
- Minimizing noise from the use of back-up alarms using measures that meet Occupational Safety and Health Administration (OSHA) regulations (e.g., the use of self-adjusting ambient-sensitive back-up alarms, manually adjustable alarms on low setting and observers)

The Authority's *Design Manual* requires the contractor to secure advance written approval from the Authority's Contracting Officer's Technical Representative prior to scheduling any activity that is anticipated to produce a sustained or repetitive noise level higher than the decibel limits indicated above. By incorporating appropriate mitigation measures, scheduling equipment appropriately, and coordinating nighttime construction efforts with the Authority, there would be no significant construction noise impacts as a result of the Proposed Action.

5.11.2.5 2023 Operational Impact Potential

Because the implementation and use of the Proposed Action would not: (1) increase the number of existing or forecast operations by time of day, aircraft type, or stage length; (2) result in a change in runway use (the ratio of flights arriving to or departing from each runway compared to the total number of arrivals and departures at the Airport); (3) change the location or use of flight tracks (the paths that pilots fly to arrive at and depart from the Airport); (4) alter departure profiles; or (5) change existing noise abatement procedures, the aircraft noise conditions for the Proposed Action and the No Action Alternative would be the same.

Impacts to existing and planned land uses in the vicinity of an airport are usually associated with the extent of aircraft noise impacts related to that airport. According to Appendix A of 14 CFR 150 and FAA Advisory Circular 150/5020-1, a proposed action is considered to have a significant impact on land use compatibility if it causes significant increases in noise exposure over residential or other noise-sensitive land uses—such as schools, parks, and historic buildings—within areas exposed to aircraft noise of DNL 65 or higher.^{29, 30} The Proposed Action would not result in any significant change in aircraft noise in the Airport environs.

5.11.3 NO ACTION ALTERNATIVE

None of the improvements included in the Proposed Action would be constructed under the No Action Alternative. No construction-related noise impacts would occur under the No Action Alternative.

5.12 Socioeconomics, Environmental Justice, and Children’s Environmental Health and Safety Risks

5.12.1 METHODOLOGY

Airport actions can have the potential for secondary, or induced, impacts on surrounding communities. These potential impacts include any shifts in patterns of population movement and growth, public service demands, changes in business and economic activities, disruption of local traffic patterns that reduce the levels of service of roads serving the airport and its surrounding communities, or other factors identified by the public.

FAA guidance contained within FAA Order 1050.1F for analysis of socioeconomic resources states that the Proposed Action would have a significant socioeconomic impact if it would:

- Induce substantial economic growth in an area, either directly or indirectly (e.g., through establishing projects in an undeveloped area);
- Disrupt or divide the physical arrangement of an established community;
- Cause extensive relocation when sufficient replacement housing is unavailable;

²⁹ 14 CFR Part 150, *Airport Noise Compatibility Planning*, January 18, 1985, as amended.

³⁰ FAA, AC 150/5020-1, *Noise Control and Compatibility Planning for Airports*, August 5, 1983.

- Cause extensive relocation of community businesses that would cause severe economic hardship for affected communities;
- Disrupt local traffic patterns and substantially reduce the levels of service of roads serving an airport and its surrounding communities; or
- Produce a substantial change in the community tax base.

According to FAA Order 1050.1F, secondary impacts can be significant when other resource categories linked to socioeconomic impacts have significant impacts. Therefore, the conclusions of the analyses of resource categories with potential social impacts, including aircraft noise (Section 5.11.2), compatible land use (Section 5.9.2), and socioeconomic impacts (Section 5.12.2), were considered. Potential impacts identified in these categories were evaluated for project-induced shifts in population movement patterns, public service demands, and business and economic activities.

Off-Airport Surface Traffic Methodology

The effect of the project on local roadways and levels of service was analyzed, since the roadways and associated service comprise one of the socioeconomic resources. Therefore, the construction traffic analysis is included in this section. More detail regarding the traffic analysis methodology, assumptions, and calculations is included in Appendix E. The methodology used to evaluate off-airport surface traffic impacts to the local roads within the study area included the following major steps:

- Determine affected environment based on likely route of soil-hauling trucks and employee construction vehicles to and from the construction site.
- Identify the quantity of soil-hauling trucks and construction employee vehicles that would access the site during the peak day of the peak phase of construction activity. This represents a conservative assessment of traffic that could be added to the study area as a result of the Proposed Action.
- Estimate the hourly construction-related traffic volumes for the peak day of the peak phase of construction.
- Establish the highest a.m. and p.m. traffic volumes that occur outside the peak commuter travel periods but within the Authority's established off-peak soil-hauling hours at the relevant study area roadways and intersections.
- Demonstrate the off-airport surface traffic impacts during the highest volume a.m. and p.m. hours that occur outside the commuter peak travel periods (i.e., the a.m. and p.m. off-peak hours).
 - Analyze the No Action operations of the relevant study area roadways and intersections using the appropriate measures of effectiveness (MOE) for each study area component (intersection delay for intersections, travel speed for U.S. Route 1, and link volume to capacity ratio for the Route 233 ramps).
 - Analyze the operations of the relevant study area roadways and intersections with peak day, peak month, and peak phase of construction traffic using the appropriate MOE for each study area component.

For the purposes of this analysis, a significant impact to arterial traffic operations is defined as one that causes for a reduction in intersection LOS from one service grade to another (i.e., A to B, B to C, C to D, D to E, or E to F).

On-Airport Surface Traffic Methodology

This section describes the assumptions and methodology used to estimate potential on-airport traffic impacts associated with construction-related employee vehicles and hauling truck activity. To analyze the potential impacts to on-airport landside facilities as a result of construction-related traffic, a curbside, roadway, and intersection analysis was performed, as more fully described in Appendix E. The analysis documented in this section consists of the following:

- A Terminal B/C Arrivals Level curbside analysis to assess the potential impacts resulting from the phased closure of the Arrivals Level curbside roadways to allow for the construction of the Secure National Hall.
- An on-airport roadway segment/intersection analysis to assess the potential impacts of construction-related employee and hauling truck traffic circulating through the Airport to access/egress the Proposed Action site.

In order to assess the impacts of the Proposed Action on the Terminal B/C Arrivals Level curbside, the future background traffic was determined, and the Proposed Action construction-related traffic was added to it. Future Airport-related traffic volumes were based on the latest origin and destination (O&D) passenger forecast developed for the Airport as part of the *DCA Public/Employee Parking and Rental Car Planning Study*, dated February 2015. This model uses the number of vehicles at curbside during the peak hour combined with average dwell times by vehicle mode to estimate the number of vehicles requiring curbside frontage during the peak hour.

A spreadsheet-based model was developed to estimate the LOS of the on-airport roadway segments that would be affected by Proposed Action-related construction traffic during the Airport's peak hour of 3:45 p.m. to 4:45 p.m.³¹ Similar to the Terminal B/C Arrivals Level curbside analysis, a condition representing the worst-case scenario for the duration of the construction period was chosen for the analysis. The final full year of construction (2021) was estimated to be the worst case as it would have the highest level of background passenger traffic in addition to the full year of Proposed Action construction-related traffic.

To estimate the LOS along key segments of the on-airport roadway system, peak-hour vehicle volumes were compared with the capacity of the individual segments. LOS A represents the optimal operating condition, characterized by uninterrupted free-flow operations. At the other end of the scale, LOS F represents the worst operating condition, characterized by severe roadway congestion and delay. LOS C is generally considered to

³¹ Airport peak hour was determined based on review of traffic data collected as part of the *DCA Roadway Network Study and Short Term Roadway Improvements*, June 2015.

be a desirable operation condition; however, LOS D conditions may be acceptable at some larger airports during peak periods.

The on-airport intersections anticipated to be affected by construction-related traffic were analyzed using the traffic modeling software SYNCHRO during the Airport's peak hour of 3:45 p.m. to 4:45 p.m., under the same conditions analyzed for the roadway segment analysis. LOS definitions for both signalized and unsignalized intersections were based on total delay and range from LOS A (i.e., excellent conditions with little or no vehicle delay) to LOS F (i.e., excessive vehicle delays and queue lengths).

An impact would be considered significant if the curbside segment, roadway segment, or intersection operating under the future Proposed Action condition is: (1) anticipated to operate at an unacceptable LOS (LOS E or F), and (2) the Proposed Action's contribution to the curbside utilization, roadway volume/capacity, or intersection delay ratio, as measured by the difference between the Proposed Action and No Action Alternative, is five percent or greater.³²

5.12.2 PROPOSED ACTION

5.12.2.1 Socioeconomics

The Proposed Action would not cause significant impacts related to aircraft noise or land use compatibility, and significant social impacts would not be expected. Therefore, the Proposed Action would not affect the surrounding community by causing shifts of or growth in population, increased public service demands, or changed business or economic activity.

Development of the Proposed Action improvements would occur on federal government-owned airport land operated by the Authority. No residences or residents would be displaced as the result of the Proposed Action. Implementation of the Proposed Action is not expected to induce shifts of or growth in population within the region that would lead to the demand for new public services or facilities. The various components of the Proposed Action would not generate any increase in the number of students or number of park users, and it would not have an impact on the performance objectives of police protection, schools, parks, or other public service facilities. The Proposed Action would not result in additional police or fire protection services compared to the No Action Alternative.³³ The Proposed Action is not anticipated to result in changes in business or economic activity that would be influenced by Airport development; therefore, no significant secondary (induced) impacts would result from the Proposed Action.

The potential to disrupt local traffic patterns by reducing the levels of service on roads that service the airport and on-airport roads that service the terminal were explained in quantitative terms because of the number of

³² Based on criteria used in *Hotel Environmental Review: Traffic Study*, Ricondo & Associates, Inc., January 2013, http://www.marylandaviation.com/_media/client/environmental/Attachment_C_Traffic_Study_%282013%29%28Draft%29.pdf (accessed December 7, 2015).

³³ Erik N. Schwenke (Environmental Planner, Metropolitan Washington Airports Authority), telephone conversation with Stephen Muench (R&A Cincinnati Office) and Virginia F. Jackson (R&A Atlanta Office), September 19, 2016.

construction truck traffic required to remove demolition debris and unsuitable material, as well as to provide suitable material for fill. The off- and on-airport traffic analysis is provided in the Surface Traffic analysis (5.12.2.2).

5.12.2.2 Surface Traffic

Off-Airport Surface Traffic 2016 to 2022 Construction Impact Potential

The following analysis is based on the Authority's commitment to minimize construction impacts and avoid the commuter peak hours of travel. Soil hauling trucks would be regulated to access/egress the construction site via Route 233 between the hours of 9:30 a.m. and 4:00 p.m. This time period falls between the typical peak periods of commuter traffic, but it includes the typical work hours for construction employees and soil haulers.

Based on the estimates of soil-hauling vehicle trips and employees' pick-up trucks, an hourly breakdown of construction trips was estimated. The breakdown, shown in **Table 5-8**, is an estimate and intended to demonstrate how the construction-related traffic could be distributed over the work day, recognizing the Authority's commitment to prevent soil-hauling movements during the peak commuter travel hours.

Table 5-8: Proposed Action-Related Construction Traffic

HOUR	EMPLOYEE VEHICLES		HAULING TRUCKS		TOTAL
	IN	OUT	IN	OUT	
7:00 a.m. to 8:00 a.m.	2	0	0	0	2
8:00 a.m. to 9:00 a.m.	3	0	0	0	3
9:00 a.m. to 10:00 a.m.	0	0	30	10	40
10:00 a.m. to 11:00 a.m.	0	0	40	40	80
11:00 a.m. to 12:00 p.m.	0	0	45	45	90
12:00 p.m. to 1:00 p.m.	5	5	20	40	70
1:00 p.m. to 2:00 p.m.	0	0	40	40	80
2:00 p.m. to 3:00 p.m.	0	0	40	40	80
3:00 p.m. to 4:00 p.m.	0	0	30	30	60
4:00 p.m. to 5:00 p.m.	0	3	0	0	3
5:00 p.m. to 6:00 p.m.	0	2	0	0	2
Total	10	10	245	245	510

SOURCE: Kimley-Horn and Associates Inc., December 2015.

PREPARED BY: Kimley-Horn and Associates, Inc., July 2015.

For the analysis of the Proposed Action, the highest hourly volumes of construction-related traffic identified in Table 5-8 were added to the background traffic volumes. By assuming that the largest amount of construction-related traffic occurs during the heaviest traffic hours of the typical day, outside of the commuter peak periods, a worse-case analysis of the impacts of construction-related traffic was determined.

The traffic analysis of the Proposed Action traffic conditions is shown in **Table 5-9**. The No Action Alternative traffic conditions are also included for comparative purposes. The analysis is representative of the peak day of activity during the 24-month construction period. The results indicate that there would be only one significant impact to off-airport surface traffic as a result of the Proposed Action. Based on the definition of significant impacts as used in this analysis, the results indicate that the northbound approach of U.S. Route 1 would operate at LOS E during the p.m. off-peak hour, with the addition of construction-related traffic, as compared to the No Action Alternative condition operation of LOS D (see **Exhibit 5-2**).

The addition of construction-generated traffic results in a decrease of northbound U.S. Route 1 LOS from D to E during the p.m. peak period. The impact would also be temporary in nature and last only as long as the phases of construction that necessitate the haul vehicles. This reduction in LOS is caused by a slowing in northbound travel speeds from 14.1 mph to 13.9 mph. The threshold that separates LOS D from LOS E is 14.0 mph. It is possible that signal-timing optimization can be implemented to offset this 0.2 mph difference. Additional green time could be further provided to the northbound through movements at the U.S. Route 1 intersections to provide efficient progression from intersection to intersection, and ultimately to I-395 out of the study area. Such signal-timing optimization would be performed in coordination with the Virginia Department of Transportation and Arlington County transportation staff in order to minimize any other impacts to side street movements.

This analysis recognizes the Authority's commitment to minimize construction impacts and avoid the commuter peak hours of travel. Construction-related traffic impacts would be further mitigated by the maintenance of traffic plans as agreed to and prepared by the Authority during the pre-construction process. The lasting impact to off-airport surface traffic would be insignificant.

On-Airport Surface Traffic 2016 to 2022 Construction Impact Potential

Terminal B/C Arrivals Level Curbside Analysis

In order to construct the Secure National Hall, portions of the Terminal B/C Arrivals Level curbside would need to be closed while construction takes place. The assumed phasing plan accounted for in the Terminal B/C Arrivals Level curbside analysis is detailed on **Exhibit 5-3**.

As shown on the exhibit, it was assumed that the following four phases would occur, with the duration of each phase estimated to be three months:

- Phase 1—south commercial vehicle arrival level roadway closure of approximately 400 feet, with construction spanning the commercial vehicle arrival level roadway plus a single lane closure of the public vehicle arrival level roadway. It was assumed that the section of public vehicle arrival level roadway would be unavailable to private vehicle loading. This would require access to the commercial vehicle arrival level roadway via the public vehicle arrival level roadway.
- Phase 2—south public vehicle arrival level roadway closure of approximately 400 feet, with construction spanning the public vehicle arrival level roadway. The commercial vehicle arrival level roadway was assumed to be fully operational under this phase. This phase would require access to the public vehicle arrival level roadway via the commercial vehicle arrival level roadway.

Table 5-9: Proposed Action Traffic Conditions

INTERSECTION	NO ACTION ALTERNATIVE CONDITIONS				PROPOSED ACTION CONDITIONS			
	OFF-PEAK ^{1/} HOUR INTERSECTION DELAY (SECONDS)		LOS BASED ON OFF-PEAK HOUR INTERSECTION DELAY ²		OFF-PEAK ^{1/} HOUR INTERSECTION DELAY (SECONDS)		LOS BASED ON OFF-PEAK HOUR INTERSECTION DELAY ²	
	AM	PM	AM	PM	AM	PM	AM	PM
U.S. Route 1 & 20th Street (north offset)	31.6	29.4	C	C	32.6	29.3	C	C
U.S. Route 1 & 20th Street (south offset)	10.2	10.8	B	B	10.1	10.6	B	B
U.S. Route 1 & 23rd Street	42.4	37.6	D	D	44.6	38.4	D	D

INTERSECTION	NO ACTION ALTERNATIVE CONDITIONS				PROPOSED ACTION CONDITIONS			
	OFF-PEAK HOUR ARTERIAL TRAVEL SPEED (MPH)		LOS BASED ON OFF-PEAK HOUR TRAVEL SPEED DELAY ^{3/} (MPH)		OFF-PEAK HOUR ARTERIAL TRAVEL SPEED (MPH)		LOS BASED ON OFF-PEAK HOUR TRAVEL SPEED DELAY ^{3/} (MPH)	
	AM	PM	AM	PM	AM	PM	AM	PM
U.S. Route 1 Jefferson Davis Highway (NB / SB)	13.6 / 10.9	14.1 / 10.9	E / E	D / D	13.4 / 10.3	13.9 / 10.6	E / E	E / D

LINK	NO ACTION ALTERNATIVE CONDITIONS				PROPOSED ACTION CONDITIONS			
	OFF-PEAK HOUR LINK VOLUME TO CAPACITY RATIO		LOS BASED ON OFF-PEAK HOUR LINK VOLUME TO CAPACITY RATIO ^{4/}		OFF-PEAK HOUR LINK VOLUME TO CAPACITY RATIO		LOS BASED ON OFF-PEAK HOUR LINK VOLUME TO CAPACITY RATIO ^{4/}	
	AM	PM	AM	PM	AM	PM	AM	PM
Route 233 WB ramp to NB Route 1	.18	.19	A	A	.23	.23	A	A
SB Route 1 ramp to EB Route 233	.72	.52	D	C	.77	.56	D	C

NOTES:

NB- Northbound

SB = Southbound

EB = Eastbound

WB = Westbound

1/ A.M. off-peak highest volume hour = 9:30 a.m. to 10:30 a.m.; P.M. off-peak highest traffic volume hour = 3:00 p.m. to 4:00 p.m.

2/ LOS as a function of intersection delay is based on the findings of the 2000 Highway Capacity Manual.

3/ LOS as a function of arterial travel speed is based on the findings of the 2000 Highway Capacity Manual.

4/ LOS as a function of airport access roadways' volume to capacity ratio is based on information presented in (1) Transportation Research Board, National Research Council, *Highway Capacity Manual*, Exhibit 2, "LOS Criteria for Multilane Highways," December 2000; and (b) Airport Cooperative Research Program, ACRP Report 40, *Airport Curbside and Terminal Area Roadway Operations*, Table 4-1, "Levels of Service for Airport Terminal Area Access and Circulation Roadways," July 2010.

SOURCE: Kimley-Horn and Associates, Inc., December 2015.

PREPARED BY: Kimley-Horn and Associates, Inc., December 2015.

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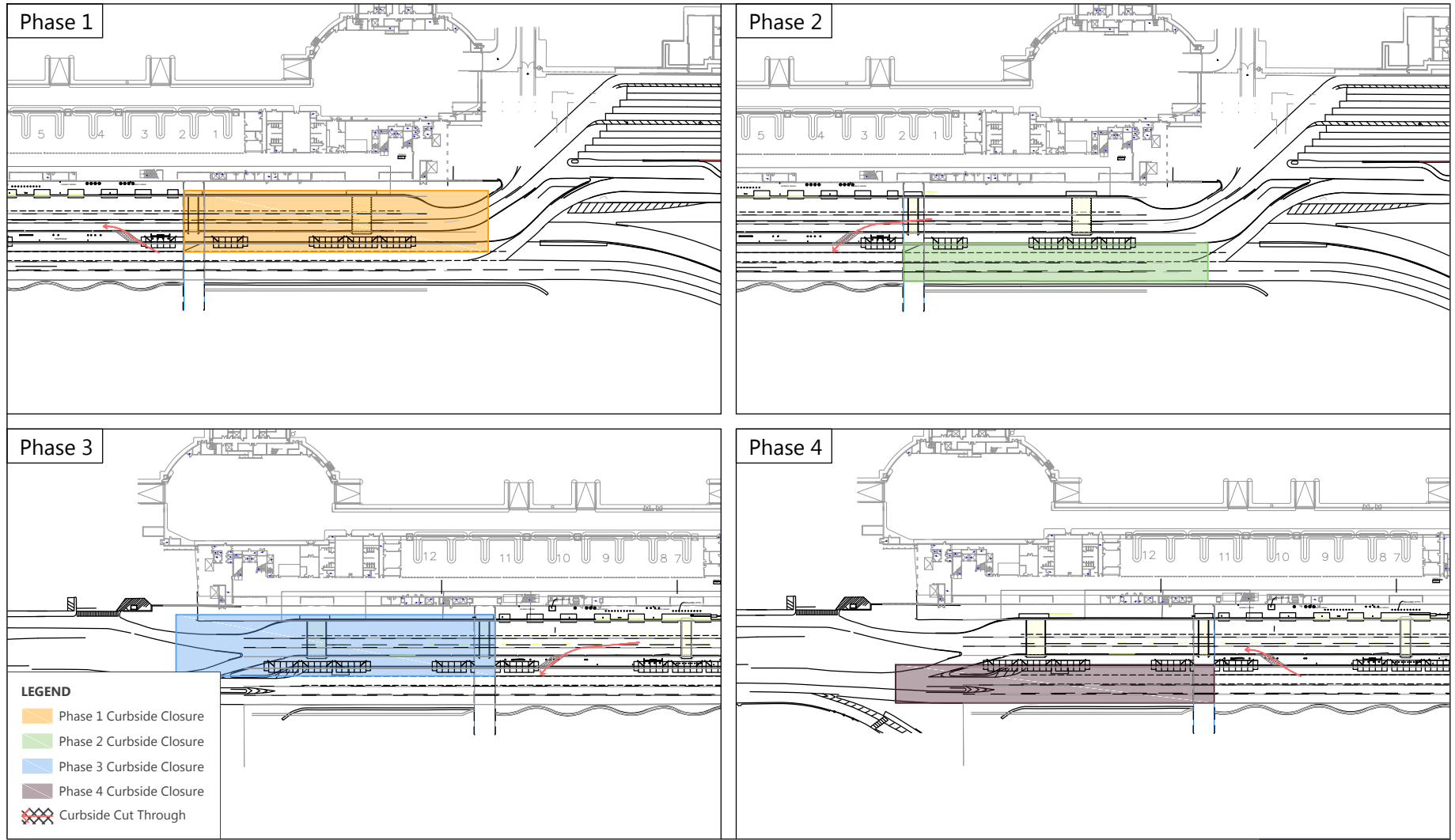
EXHIBIT 5-2



Off-Airport Surface Traffic Construction Impact

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SOURCE: Ricondo & Associates, Inc., July 2015.
 PREPARED BY: Ricondo & Associates, Inc., January 2016.

EXHIBIT 5-3

Terminal B/C Arrivals Level Curbside
 Phasing Plan Assumptions



Drawing: N:\MWA\IMWAA On-Call (14-08-0868)\Task 03 - DCA New North Concourse EA\04 CAD\Curbv3.dwg_Layout: Construction-All (2)_Nov 02, 2016, 2:37pm

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- Phase 3—north commercial vehicle arrival level roadway closure of approximately 420 feet, with construction spanning the commercial vehicle arrival level roadway plus a single lane closure of the public vehicle arrival level roadway. It was assumed that the section of public vehicle arrival level roadway would be unavailable to private vehicle loading. This would require access to the public vehicle arrival level roadway via the commercial vehicle arrival level roadway.
- Phase 4—north public vehicle arrival level roadway closure of approximately 420 feet, with construction spanning the public vehicle arrival level roadway. The commercial vehicle arrival level roadway was assumed to be fully operational under this phase. This phase would require access to the commercial vehicle arrival level roadway via the public vehicle arrival level roadway.

The analysis assumed that no construction-related traffic would use the curbside roadways to access the Proposed Action site. The 2021 Proposed Action Terminal B/C Arrivals Level curbside volumes are equivalent to the 2021 No Action traffic volumes. The analysis is based only on the curbside closures (Phase 1 through Phase 4) described in this section. The volumes used for the Proposed Action Terminal B/C Arrivals Level curbside analysis are presented in **Table 5-10**.

Table 5-10: Proposed Action Terminal B/C Arrivals Level Curbside Peak Hour Volumes

2021 PEAK HOUR VOLUME ^{1/}	
Commercial vehicle arrival level roadway	
Taxicabs	348
Shared Ride Vans	7
Parking/RAC Shuttles	32
Hotel/Motel Shuttles	35
Employee Parking Shuttles	12
Service Vehicles/Other	7
Total	441
Public vehicle arrival level roadway	
Private Vehicles/Limousines	1,351

NOTE:

1/ Volumes represent peak month, busy day: 3:45 p.m. to 4:45 p.m.

SOURCE: Ricondo & Associates, Inc., July 2015.

PREPARED BY: Ricondo & Associates, Inc., December 2015.

The results of the Terminal B/C Arrivals Level curbside analysis, under the Proposed Action condition, are presented below in **Table 5-11**. The Proposed Action would not cause a significant construction-related impact to the Arrivals Level curbside. Even though the curbside utilization increases, the LOS would remain in the acceptable range.

Table 5-11: Proposed Action Terminal B/C Arrivals Level Curbside Analysis Results and Impact Analysis

	2021 NO ACTION ALTERNATIVE			2021 PROPOSED ACTION			CURBSIDE UTILIZATION INCREASE (PERCENT)	IMPACT?
	CURBSIDE LENGTH AVAILABLE (FEET)	CURBSIDE UTILIZATION (PERCENT)	LOS	CURBSIDE LENGTH AVAILABLE (FEET)	CURBSIDE UTILIZATION (PERCENT)	LOS		
Phase 1								
Commercial vehicle arrival level roadway	1,450	35	A	1,050	53	A	52	No
Private vehicle arrival level roadway	1,450	105	B	1,050	157	D	49	No
Phase 2								
Commercial vehicle arrival level roadway	1,450	35	A	1,450	38	A	10	No
Private vehicle arrival level roadway	1,450	105	B	1,050	157	D	49	No
Phase 3								
Commercial vehicle arrival level roadway	1,450	35	A	1,030	54	A	55	No
Private vehicle arrival level roadway	1,450	105	B	1,030	160	D	52	No
Phase 4								
Commercial vehicle arrival level roadway	1,450	35	A	1,450	38	A	10	No
Private vehicle arrival level roadway	1,450	105	B	1,030	160	D	52	No

SOURCE: Ricondo & Associates, Inc., December 2015.

PREPARED BY: Ricondo & Associates, Inc., December 2015.

On-Airport Roadway Segment and On-Airport Intersection Analysis

With respect to roadway and intersection traffic, the construction-related traffic presented in Table 5-8 was added to the 2021 Airport-related traffic volumes for the roadway and intersection analyses for the corresponding peak hour (3:45 p.m. to 4:45 p.m.). For purposes of this analysis, all trips presented in Table 5-8 were converted to a “passenger car equivalent” (PCE) to account for the additional impact that larger vehicles, such as hauling trucks, would have on roadway traffic operations. As such, the number of construction-related vehicle trips was multiplied by the following PCE factors: employee vehicles, 1.0; hauling trucks, 1.5.³⁴

The results of the roadway segment analysis, under the Proposed Action condition, are presented below in **Table 5-12**. Three segments would be at LOS F under the No Action Alternative. Adding the construction-related traffic would not increase the volume/capacity ratio by more than five percent. Therefore, based on the significance criteria for this analysis, the impact would be less than significant.

Table 5-12: Proposed Action Roadway Segment Analysis Results and Impact Analysis

SEGMENT ID ^{1/}	SEGMENT CAPACITY ^{2/}	2021 NO ACTION ALTERNATIVE			2021 PROPOSED ACTION			INCREASE (PERCENT)	IMPACT?
		PEAK HOUR VOLUME ^{3/}	VOLUME/CAPACITY	LOS	PEAK HOUR VOLUME ^{3/}	VOLUME/CAPACITY	LOS		
1	1,170	1,556	1.33	F	1,557	1.33	F	0.0%	No
2	3,030	3,174	1.05	F	3,221	1.06	F	0.9%	No
3	2,020	2,053	1.02	F	2,100	1.04	F	2.0%	No
4	2,580	941	0.36	B	987	0.38	B	5.6%	No
5	1,010	736	0.73	D	737	0.73	D	0.0%	No
6	2,580	1,262	0.49	C	1,307	0.51	C	4.1%	No
7	1,010	225	0.22	A	270	0.27	B	22.7%	No
8	2,020	505	0.25	B	550	0.27	B	8.0%	No

NOTES:

1/ Refer to Exhibit E-5 (Appendix E) for roadway segment locations.

2/ Based on criteria presented in Table E-4 (Appendix E), i.e., roadway classification, free flow speed, and number of lanes.

3/ Volumes (PCEs) represent peak month, busy day: 3:45 p.m. to 4:45 p.m.

SOURCE: Ricondo & Associates, Inc., December 2015.

PREPARED BY: Ricondo & Associates, Inc., December 2015.

The results of the intersection analysis, under the Proposed Action condition, are presented below in **Table 5-13**. The analysis shows that traffic related to the construction of the Proposed Action would cause a significant peak-hour impact at the intersection of Route 233 and Abingdon Drive. It is estimated that during the peak-hour the intersection would operate at LOS F in the No Action alternative, and the additional construction-related traffic accessing/egressing the site would cause an increase in delay greater than five percent. As this peak-hour impact is related to construction employee vehicles and hauling truck trips, the

³⁴ Transportation Research Board, *Highway Capacity Manual: Volume 2*, Exhibit 11-11, December 2010.

impact would be temporary, and mitigation would not be required. Furthermore, this temporary impact would not extend beyond the Airport's property. The Proposed Action would not cause an increase in forecast passenger levels and would not change on-airport traffic after construction activities were completed.

Table 5-13: Proposed Action Intersection Analysis Results and Impact Analysis

INTERSECTION ^{1/}	2021 NO ACTION ALTERNATIVE		2021 PROPOSED ACTION		INCREASE	IMPACT?
	DELAY	LOS	DELAY	LOS		
Route 233 and Abingdon Drive ^{2/}	112.4	F	131.5	F	17.0%	Yes
Route 233 and Airport Exit to GWMP ^{3/}	12.5	B	12.5	B	0.0%	No
Sam Smith Boulevard and Aviation Circle ^{2/}	13.0	B	14.6	B	12.3%	No

NOTES:

1/ Refer to Exhibit E-5 (Appendix E) for intersection locations.

2/ Signalized intersection

3/ Unsignalized intersection

SOURCE: Ricondo & Associates, Inc., December 2015.

PREPARED BY: Ricondo & Associates, Inc., December 2015.

On-Airport Surface Traffic 2023 Operational Impact Potential

Upon completion of the Proposed Action, employees currently parking near the COB and Hangar 11 would be displaced and relocated. There would be approximately 400 affected employees. The tenants of Hangar 11, and possibly a limited number of Authority employees as well, would be relocated to the renovated space in the South Hangar Line and possibly to Historic Terminal A. Some employees would be relocated to Dulles International and others to a yet-to-be determined location in nearby Crystal City. This would result in a change to current traffic patterns as these employees would be accessing/egressing a new lot location. This change would not significantly impact on-airport traffic as the number of employees on-airport would decrease. The relocation of employees off-airport is unlikely to affect regional roadways as many of the same roadways used to access the Airport would be used to access office space in Crystal City. There would be no noticeable effect on how passengers utilize the on-airport roadway network.

5.12.2.3 Environmental Justice

As defined by DOT Order 5610.2(a) ³⁵:

- *Minority* means a person who is:
 - Black: a person having origins in any of the black racial groups of Africa;
 - Hispanic or Latino: a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race;

³⁵ DOT Order 5610.2(a), *Environmental Justice in Minority and Low-Income Populations*, April 15, 1997, updated May 2012.

- Asian American (a person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands); or
 - American Indian and Alaskan Native: a person having origins in any of the original people of North America and who maintains cultural identification through tribal affiliation or community recognition.
- *Minority population* means any readily identifiable groups of minority persons who live in geographic proximity, and, if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who will be similarly affected by a proposed DOT program, policy, or activity.
 - *Low-income* means a person whose median household income is at or below the Department of Health and Human Services poverty guidelines. (Although, DOT Order 5610.2(a) directs DOT agencies, including the FAA, to identify low-income populations using the Department of Health and Human Services poverty guidelines, CEQ, and the EPA guidance references the U.S. Census Bureau's annual statistical poverty thresholds on income and poverty (Series P-60) to define low income. The Department of Health and Human Services poverty guidelines and the Census Bureau's poverty threshold differ slightly. The responsible FAA official should use the Department of Health and Human Services poverty guidelines as directed in DOT Order 5610.2(a). CEQ's environmental justice guidance may be drawn upon, as appropriate, after the requirements of DOT Order 5610.2(a) have been met.³⁶)
 - *Low-income population* means any readily identifiable group of low-income persons who live in geographic proximity, and, if circumstances warrant, it also means geographically dispersed/transient persons (such as migrant workers or Native Americans) who will be similarly affected by a proposed DOT program, policy, or activity.
 - *Adverse effects* means the totality of significant individual or cumulative human health or environmental effects, including interrelated social and economic effects, which may include, but are not limited to: bodily impairment, infirmity, illness or death; air, noise, and water pollution and soil contamination; destruction or disruption of manmade or natural resources; destruction or diminution of aesthetic values; destruction or disruption of community cohesion or a community's economic vitality; destruction or disruption of the availability of public and private facilities and services; vibration; adverse employment effects; displacement of persons, businesses, farms, or nonprofit organizations; increased traffic congestion, isolation, exclusion, or separation of minority or low-income individuals within a given community or from the broader community; and the denial of, reduction in, or significant delay in the receipt of and benefits of DOT programs, policies, or activities.
 - *Disproportionately high and adverse effect on minority and low-income populations* means an adverse effect that: (1) is predominately borne by a minority population and/or a low-income population, or (2) will be suffered by the minority population and/or low-income population and is appreciably more

³⁶ DOT, FAA, *1050.1F Desk Reference*, Section 12, "Socioeconomic, Environmental Justice, and Children's Environmental Health and Safety Risks," Subsection 12.2.2, "Affected Environment," July 2015.

severe or greater in magnitude than the adverse effect that will be suffered by the nonminority population and/or non-low-income population.

Environmental justice impacts were evaluated by determining whether the Proposed Action and the No Action Alternative would have disproportionately high and adverse human health or environmental impacts on minority and low-income populations. Also evaluated were impacts to resources important to communities of environmental justice concern.

Census data was obtained to establish the demographic and socioeconomic baseline for the Airport environs (refer to Table 4-11 in Section 4.13.3). No significant environmental impacts would occur as a result of construction or operation of the Proposed Action. The Proposed Action would have no greater impact on minority or low-income populations than any other populations in the Airport environs. Therefore, the Proposed Action would not result in a disproportionately high and adverse human health or environmental effect on minority or low-income populations.

5.12.2.4 Children's Environmental Health and Safety Risks

Impacts of the Proposed Action and No Action Alternative were assessed with regard to compliance with Executive Order 13045. Schools and daycare centers located in the Airport environs were identified in Exhibit 4-6, and any specific health concerns for children are qualitatively described. A significant impact would occur if the action would cause disproportionate health and safety risks to children.

As described in Sections 5.2, "Air Quality," and 5.14, "Water Resources," the Proposed Action would not result in significant air quality or water quality impacts. As described in Section 5.7, "Hazardous Materials, Solid Waste, and Pollution Prevention," the Proposed Action would not result in the exposure of humans to hazardous substances. The Proposed Action would not result in significant operational noise impacts that would affect children's health or pose safety risks, and it would not result in environmental health and safety risks that may disproportionately affect children.

5.12.3 NO ACTION ALTERNATIVE

There would be no construction, demolition, or changes to Airport property or the area around DCA under the No Action Alternative. There would be no impacts on population or public service demand associated with the No Action Alternative. Therefore, no secondary (induced) impacts would occur under the No Action Alternative.

The No Action Alternative does not include any property acquisition or construction and, therefore, would not result in the relocation of residences or businesses, alteration of traffic patterns, division of communities, disruption of planned development, or appreciable changes in employment. The quality of life and noise levels in surrounding areas would not be affected, and no impacts to low-income populations, minority populations, or children would occur.

5.13 Visual Effects

An analysis of the impact of light emissions on a surrounding environment is required when proposed projects introduce new lighting that may affect residential or other sensitive land uses. Similarly, airport improvement projects that may disrupt the natural environment or aesthetic integrity of the area or affect sensitive resources, such as public parks or historic sites, are relevant visually. Therefore, the potential for the proposed Terminal B/C redevelopment to visually affect nearby light-sensitive areas was considered in this EA, and the potential visual impacts of the Proposed Action in contrast with the existing environment, architecture, historical and cultural setting, and land-use planning were also considered. Existing light emissions and visual impacts within the affected environment are discussed in Section 4.14.3.

5.13.1 METHODOLOGY

The potential light emission impacts of the proposed improvements on residential areas and/or nearby light-sensitive sites were evaluated for the Proposed Action and the No Action Alternative. The potential light emission and visual impacts of the proposed redevelopment of Terminal B/C, including the Secure National Hall, NNC, and related improvements, were considered by evaluating existing on-airport light sources (i.e., concourses, facilities, runways and taxiways, apron areas, parking lots, roadways) and assessing future lighting effects based on the proposed redevelopment plans. The evaluation of the effects of light emissions considered whether or not an action's light emissions would create annoyance to or interfere with normal activities. The change to the visual character of the north airport, as seen from historic resources, was also considered.

Exhibit 5-4 illustrates potential light-sensitive areas and important viewsheds in the vicinity of the Proposed Action. As described below, these include the view from Gravelly Point (location "A"), from Mount Vernon Trail and the parallel GWMP (location "B"), from Long Bridge Park (location "C"), and from East Potomac Park, from the Monumental Core of the nation's capital (location "D"), and from the GWMP (location "E").

- View from Gravelly Point (location "A")—Gravelly Point provides views toward the District of Columbia-area viewshed, including the Monumental Core of the nation's capital, and towards the Airport.
- View from Mount Vernon Trail Northwest of the Airport (location "B")—Along this stretch of the Mount Vernon Trail, the view is toward the airfield. An existing 8-foot-high blast fence is located between the Runway 15 end and the trail, which obscures the view of the airfield.
- View from Long Bridge Park (location "C")—An overlook at the north end of the park provides views of the Roaches Run Waterfowl Sanctuary, the Washington D.C. capital monuments, and towards the Airport.
- View from the East Potomac Park Area and Monumental Core of the Nation's Capital (location "D")—This view is toward the airfield from the eastern shore of the Potomac River.
- View from GWMP (location "E") —This view is toward the existing COB and Hangars 11 and 12.

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LEGEND

- Ⓐ Representative Location
- Limits of Physical Disturbance (LOPD)
- 1/ West Potomac Park, Jefferson Memorial, and Franklin Delano Roosevelt Memorial Park
- 2/ George Washington Memorial Parkway

SOURCES: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community, January 2016; Ricondo & Associates, Inc., October 2016.
 PREPARED BY: Ricondo & Associates, Inc., November 2016.

EXHIBIT 5-4



Potential Light Sensitive Areas and Important Views in the Vicinity of the Airport

W:\Projects\DC\A\N\NC EAMXD\sl\Final\Exhibit 5-4 Potential Light Sensitive Areas and Important Views\sls_110216.mxd

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The Proposed Action includes above-grade improvements (i.e., the NNC, Secure National Hall, demolition of existing structures and construction of a replacement hangar, and modifications to the Central Plant) and at-grade improvements (i.e., aircraft parking apron and taxiway modifications in vicinity of the NNC and for aircraft that remain at the Airport overnight). The components of the Proposed Action that have the most potential to result in light emission or visual impacts are the new lighting associated with the NNC and the change in the visual character of the north part of the Airport as a result of the demolition of existing structures.

5.13.2 PROPOSED ACTION

5.13.2.1 2016 to 2022 Construction Impact Potential

The demolition of the COB, Hangars 11 and 12, and the temporary modifications to Lot K and the existing contractor staging area have the potential to modify the visual character of the north part of the Airport when viewed from adjacent historic properties, specifically the GWMP and East Potomac Park. However, the Lot K modifications are temporary, and a new hangar is proposed in the approximate location of Hangar 12. Furthermore, the temporary modifications to Lot K will not be out of character with the existing visual environment of the airport. Since detailed design plans have not yet been developed for the proposed new hangar, the potential effect of this project element on the historic resources would require continued assessment and consultation with SHPO. It is not anticipated that the Proposed Project would result in an Adverse Effect to either of these historic resources. The SHPO has issued a conditional finding of No Adverse Effect to historic properties for the Proposed Action. SHPO's conditional finding is included in Appendix B.

To help ensure that construction activities would not create light or glare impacts during daylight and non-daylight hours, the construction contractor would arrange all temporary construction-related lighting in a manner such that direct light rays would not shine on or produce glare for adjacent roadway and airfield traffic. The construction of the Proposed Action would not create significant light or visual impacts as compared to the No Action Alternative.

5.13.2.2 2023 Operational Impact Potential

The Airport is located within an urban environment with a high level of existing ambient light emissions. Light and glare associated with the study area is presently generated by buildings and exterior sources to protect and secure people, property, and the air transportation system. Lighting associated with these facilities in the area of the Proposed Action illuminates the Airport exit road, Metrorail line, and GWMP to the west; automobile parking and Taxiway November to the east; an aircraft holding apron to the north; and the north end of existing Terminal B/C to the south. As shown on Exhibit 2-3, existing (light-emitting) airport structures located within the limits of the Proposed Action's project site include the COB, Hangar 11, and Hangar 12.

The proposed NNC would be located immediately east of the Authority's existing COB and immediately southeast of Hangar 11 and Hangar 12. The height of the proposed NNC is anticipated to be the same as the heights of the existing concourses (approximately 48.5 feet above ground level [AGL]), which is approximately 2.5 feet higher than the existing COB and approximately 30 feet lower in height when compared to the heights of Hangars 11 and 12. The new hangar that would replace Hangar 12 is not anticipated to be any

higher than the existing hangar. Therefore, no noticeable change in lighting compared to the existing level of lighting is anticipated.

As described in Section 2, the preferred concept includes a Secure National Hall that would provide interconnectivity between the existing and proposed piers of Terminal B/C. Two new passenger SSCPs would be constructed above the arrivals level roadway (lower level) at the Secure National Hall level. The proposed checkpoints would be located in between the DCA Concourse and the elevated DCA Metrorail station: (1) the first security checkpoint would be located north of the north Metro pedestrian bridge, and (2) the second security checkpoint would be positioned south of the south Metro pedestrian bridge.

Existing light emissions are prevalent in the vicinity of these two proposed passenger SSCPs. Lighting exists for vehicle and pedestrian safety along the departures level (upper) and arrivals level (lower) roadways, the elevated Metrorail station, the associated Blue and Yellow Metrorail lines, the two enclosed pedestrian bridges that connect the Metrorail station and parking lots to the concourse level (upper level) of Terminal B/C, concourse-related lighting, and automobile and rental car parking. The light emissions from the Secure National Hall would be largely blocked from off-airport receptors by Terminal B/C, the Metrorail, and parking garages. New light fixtures associated with the Proposed Action would be directed downward to reduce light emissions and prevent potential hazards to landing and departing aircraft. Light emissions from the NNC and replacement hangar would not be discernible against the background of existing airport-related lighting. Lighting associated with the Proposed Action would be consistent with lighting in an urban environment. The closest residential area is the Crystal Place Apartments, approximately 1,100 feet from the construction site and separated from the project area by railroad tracks, the GWMP, an area of trees, and the terminal roadway system. Residential areas are not located directly adjacent to the proposed project site and, therefore, would not experience a noticeable increase in light emissions.

In terms of visual impacts, consideration was given to the extent changes in critical viewsheds that would be impacted by the implementation of the Proposed Action. From the GWMP, the difference in height of the NNC and the COB is negligible (2.5 feet) and would not be discernable. Compared to existing COB, Hangar 11, and Hangar 12, the NNC would be lower in height, and its northernmost point would be located approximately 500 feet farther south from the critical viewsheds of Gravelly Point, Roaches Run, and Long Bridge Park. The NNC would be southwest of East Potomac Park and across the Potomac River. The project site is located within a developed, urban area surrounded by the existing terminal, airfield pavement, buildings, taxiways, roadways, and other airport uses. The Proposed Action is not anticipated to create a noticeable change from existing viewsheds.

5.13.3 NO ACTION ALTERNATIVE

The No Action Alternative would not result in any development or change in land uses; therefore, no change to existing light emission or visual impacts would occur.

5.14 Water Resources

5.14.1 PROPOSED ACTION

5.14.1.1 Wetlands

Wetlands and Waters of the United States (WOTUS), as well as resources regulated by other resource agencies within the affected environment, are discussed in Section 4.15.1.3 of this EA. The locations of these resources were compared to the LOPD for the Proposed Action to identify any potential impacts to wetlands or WOTUS.

No vegetated wetlands or stream channels regulated by the U.S. Army Corps of Engineers (ACE), VDEQ, or VMRC are located on Airport land within the LOPD. Neither the construction nor the operation of the Proposed Action would impact wetlands or WOTUS, and mitigation would not be necessary.

5.14.1.2 Floodplains

Floodplains within the affected environment are discussed in Section 4.15.2.3 of this EA. The information and data regarding the location of floodplains gathered during the inventory of resources were compared to the LOPD in order to identify potential impacts to the existing floodplains associated with the Proposed Action.

The Airport is subject to tidal flooding from the Potomac River. Under the Proposed Action, no new impervious surface would be added within the 100-year floodplains as shown on Exhibit 4-11. Considering the tidal influence and vast expanse of the Potomac River in this area, and the location of the proposed improvements, the Proposed Action would not present any barriers to floodflow passage. The construction and operation of the Proposed Action would not impact the lateral extent, depth, or duration of flooding, and it would not increase the flood risk at the Airport or on adjacent properties upstream or downstream of the Airport.

Considering the manmade nature of the Airport peninsula, existing development and maintained land uses, and the airfield's stormwater management system, the floodplain on DCA property does not have substantial natural or beneficial value (i.e., it does not carry and store floodwaters; sustain agriculture, aquaculture, or aquatic or terrestrial organisms; provide for groundwater recharge; provide recreation opportunities; or maintain water quality).

As stated in Section 4.15.2.1, the Airport is not subject to Arlington County floodplain regulations; therefore, there would be no local floodplain requirements. The Proposed Action would be designed to conform to FEMA regulations and applicable state and local stormwater management guidelines and best management practices.

Because no elements of the Proposed Action would occur within the 100-year floodplain, the Proposed Action would not result in new or increased impacts on natural and beneficial floodplain values. No mitigation would be necessary.

5.14.1.3 Surface Waters and Groundwater

Water resources and existing water quality are discussed in Section 4.15.3.3. Potential water quality impacts typically associated with airfield improvement projects include soil erosion and sediment transport, increased stormwater runoff, and a decreased groundwater recharge rate. Water quality impacts associated with a proposed project can occur as a result of operational changes as well as from construction activity related to implementation of a proposed action. The potential for water quality impacts associated with this Proposed Action compared to the No Action Alternative are presented in this section.

The information and data gathered regarding water quality and the locations of water resources were compared to the LOPD to identify potential impacts to any surface or groundwater resources. Aircraft operational procedures associated with the Proposed Action compared to the No Action Alternative were also evaluated for any potential impacts to water quality and water resources.

Construction Years 2016–2022 Impact Potential

During construction, the Proposed Action would have the potential to temporarily affect localized water quality conditions due to soil erosion and stormwater runoff from construction activities conducted on land. The VDEQ administers Virginia's Erosion and Sediment Control Law. The Authority's design and construction program requires any project that involves excavation, landfill, or soil disturbance to include erosion and sediment control measures in accordance with that law and the latest version of the *Virginia Erosion and Sediment Control Handbook*.³⁷ Individuals who administer the Authority's program are certified by VDEQ as Combined Program Administrators. Under this program, individual erosion and sediment control plans approved by the Authority's Building Codes/Environmental Department are required for each construction project. All construction plans and contracts would be prepared in accordance with FAA AC 150/5370-10C, *Standards for Specifying Construction of Airports*, which includes requirements for temporary air and water pollution, soil erosion, and siltation control. All necessary erosion and sediment control measures would be implemented prior to beginning each element of construction. In accordance with the Airport's MSGP, for any construction-related stormwater discharges from construction activities greater than 1-acre, a Notice of Intent (NOI) would be submitted to the EPA for coverage under the Construction General Permit (CGP). Additionally, a VSMP permit will be required from VDEQ for construction-related stormwater discharges from construction activities greater than 2,500 square feet. The Proposed Action would comply with the Virginia Erosion and Sediment Control Regulations.³⁸

Although land-based construction of the Proposed Action would include soil-disturbing activities and the placement of additional pavement, the improvements would be designed and constructed so as to reduce soil erosion and decrease potential inputs of chemical nutrients and sediments to the adjacent receiving waters (i.e., Roaches Run and an unnamed tributary to Roaches Run) and, ultimately, the Chesapeake Bay, in accordance with the Virginia Stormwater Management Regulations.

³⁷ Virginia Department of Environmental Quality, *Virginia Erosion and Sediment Control Handbook*, 1992, <http://www.deq.virginia.gov/Programs/Water/StormwaterManagement/Publications/ESCHandbook.aspx> (accessed July 24, 2015).

³⁸ 9 VAC § 25-840.

During construction, it is anticipated that dewatering would be required. If contaminated stormwater water is encountered during construction, a Permit to Discharge from Petroleum Contaminated Sites would be obtained from the VDEQ in accordance with the Virginia Authorization to Discharge³⁹.

With the closest groundwater recharge area located west of I-395, near Arlington National Cemetery, the Proposed Action would have no adverse effect on groundwater resources.

2023 Operational Impact Potential

In terms of point-source water pollution control, the EPA manages the overall National Pollutant Discharge Elimination System (NPDES) program and regulates point-source stormwater discharges from the Airport into the Potomac River, Roaches Run, and Four Mile Run. All operational activities at the Airport are managed in accordance with the provisions and requirements of the Airport's existing MSGP permit. As part of the permit, the Authority maintains a SWPPP, which includes all major Airport tenants as co-permittees. Depending on the ultimate design of the proposed facilities and any subsequent changes to the stormwater characteristics or outfalls, a modification to the existing stormwater permit and SWPPP may be required.

Redevelopment of existing impervious surfaces, and the proposed additional impervious surface resulting from the Proposed Action, would be designed to manage stormwater runoff in accordance with the storage and pre- and post-flow requirements of the Virginia Stormwater Management Program (VSMP) as well as the guidance in FAA Advisory Circular, *Surface Drainage Design* (or current version), Virginia stormwater management regulations, and the Virginia post construction BMPs.^{40, 41, 42, 43} The Proposed Action increases the impervious surface area within the LOPD by 305 square feet (0.007 acres).

The Proposed Action is unlikely to have adverse permanent impacts on water quality. The same numbers and types of aircraft operations would occur under the Proposed Action and the No Action Alternative; therefore, the total amount of any industry-specific pollutants to be controlled in the runoff would not increase as a result of the Proposed Action.

5.14.2 NO ACTION ALTERNATIVE

None of the improvements included in the Proposed Action would be constructed under the No Action Alternative. Therefore, no impacts to wetlands or WOTUS would occur under the No Action Alternative.

None of the improvements included in the Proposed Action would be constructed under the No Action Alternative. Therefore, no impacts to floodplains would occur under the No Action Alternative.

³⁹ Code of Virginia, § 25-120.

⁴⁰ Code of Virginia § 25-870.

⁴¹ FAA, AC 150/5320-5C.

⁴² Code of Virginia, §62.1-44.15:24 et seq

⁴³ VDEQ, <http://www.vwrrc.vt.edu/swc/PostConstructionBMPs.html>, (accessed January 25, 2016).

None of the improvements included in the Proposed Action would be constructed under the No Action Alternative. There would be no changes to existing stormwater management conditions. All potential effects from existing and future Airport operations would be managed as required by the Airport's existing NPDES permit and SWPPP for the Airport. No changes in impacts to water quality would occur under the No Action Alternative.

5.15 Cumulative Impacts

5.15.1 METHODOLOGY

To further determine whether the Proposed Action would have a significant environmental impact, the impacts on resources caused by the Proposed Action and impacts on the same resources caused by past, present, and reasonably foreseeable future actions were reviewed to determine if any significant impacts would occur when the Proposed Action's impacts are added to the impacts of those other actions.^{44 45} The CEQ defines a cumulative impact as the impact on the environment that results from the incremental impact of a proposed action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or nonfederal) or person undertakes such other actions.

A list of past, present, and reasonably foreseeable projects both at the Airport and in the vicinity of the Airport (the Cumulative Impacts Projects) were identified and are discussed below. For a project to have potential cumulative effects with the Proposed Action, the project must result in impacts on the same resources impacted by the Proposed Action. Construction-related impacts of the Cumulative Impacts Projects were considered if the impacts occurred during the construction period for the Proposed Action (i.e., beginning in the spring of 2016, completed by the end of 2022). Non-construction impacts were also considered.

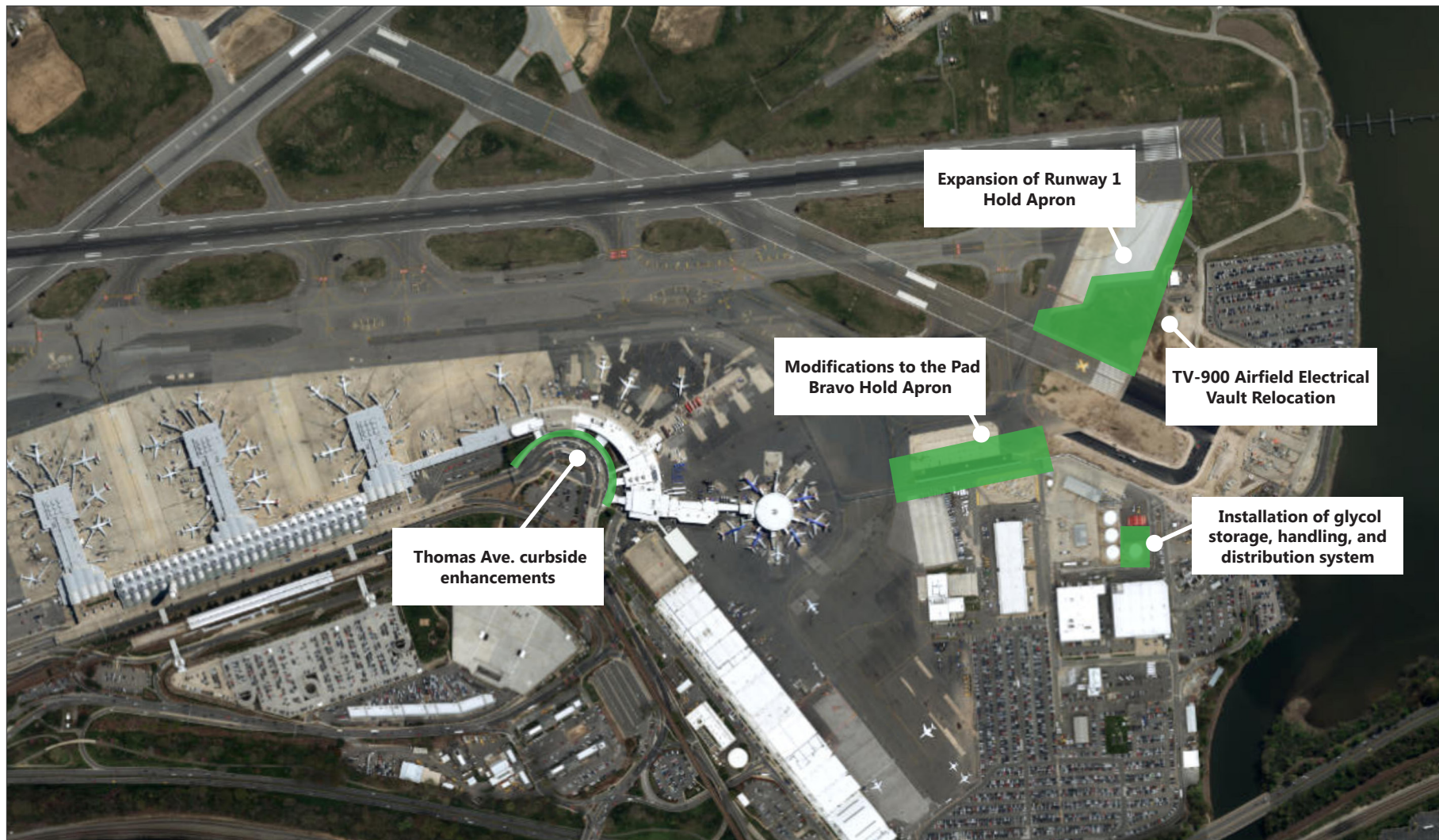
5.15.2 ACTIONS CONSIDERED

The effects of the following actions were considered in this EA. These actions are collectively referred to as the Cumulative Impact Actions and shown on **Exhibit 5-5**.

Expansion of Runway 1 Hold Apron—The existing apron will be expanded approximately 165,000 square feet to enable the hold block to accommodate additional aircraft for departure holds/sequencing, parking, circulation, and deicing operations during winter snow events. This project is scheduled for construction between October 2017 and September 2020.

⁴⁴ DOT, FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, Paragraph 4-2.d.(3), July 2015.

⁴⁵ FAA, Order 5050.4B, Paragraph 706.h.



SOURCE: Metropolitan Washington Airports Authority, April 2016.
PREPARED BY: Ricondo & Associates, Inc., April 2016.

EXHIBIT 5-5



Cumulative Impact Actions

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TV-900 Airfield Electrical Vault Relocation—The TV-900 electrical vault needs to be relocated, because the area is prone to flooding, and the vault is physically in the footprint of the Hold Apron expansion project. The vault building and associated regulators will be relocated to an area in the south portion of the airport. The transformer vault and associated regulators are the primary source of power for all airfield lighting and navigation aids. The transformer vault is in an approximately 3,000-square-foot building and includes enclosed regulators, switchgear(s), controls/communication equipment, shops, offices, a breakroom, restrooms, and a generator. Additionally, all existing electrical and communication duct banks will be redirected to the new site. Construction is currently planned between December 2016 and May 2019.

Modifications to the Pad Bravo Hold Apron—The expansion of Pad B will include approximately 102,000 square feet of concrete that will accommodate more aircraft for departure holds/sequencing, parking, circulation, and deicing operations during winter snow events. The project will include lighting, marking, and drainage systems to accommodate deicing requirements and is planned for construction between November 2016 and September 2019.

Installation of glycol storage, handling, and distribution system—The project is designed to capture spent deicing fluids before they reach surrounding waterways. The proposed system will consist of an above-ground storage tank used to store spent glycol fluids and associated pipes and pumps to the Runway 1 Hold Pad, Pad B Hold Apron, and the runway/taxiway trench drains. The tank will be located in the south area of the Airport. The construction period is planned between September 2018 and October 2021.

Thomas Avenue curbside enhancements—This project will replace bus shelters, railing, and signage along the curb line of Terminal A. The work will also include lighting improvements and modification to the sidewalk to improve passenger flow. This project is currently funded for design, and construction funding has yet to be programmed.

5.15.3 ACTIONS NOT CONSIDERED AND WHY

The following actions were not considered as Cumulative Impacts Projects; although, they could occur in proximity to the same environmental resources that would be affected by the Proposed Action for the following reasons:

In-line Baggage Screening—This project has been designed and put on hold. There is no schedule for this project at this time.

New Parking Facilities—The Authority is currently undertaking a planning study to identify areas for additional parking. The options include a new multilevel parking garage or the addition of levels to existing garages. The timing of the project is uncertain. The project is not ripe for decision as preliminary alternatives are still being reviewed.

Permanent Baggage Claim Hall (Terminal A)—This baggage claim hall would be associated with the Terminal A redevelopment. This project is conceptual at this stage, and it is not anticipated within the next 10 years. This project is not ripe for decision.

5.15.4 CUMULATIVE IMPACTS

5.15.4.1 Air Quality

With the exception of the Thomas Avenue curbside enhancements (which are currently not scheduled for construction), all of the Cumulative Impact Actions would occur within the construction period of the Proposed Action. The construction efforts of the actions considered are relatively minor, and construction-related emissions can be assumed to be below *de minimis* levels. The Cumulative Impact Actions are not expected to cause construction or operational air quality impacts. Therefore, cumulative air quality impacts from the Cumulative Impact Actions and the Proposed Action are not anticipated.

5.15.4.2 Biological Resources

A variety of federal and state agencies and local wildlife organizations manage and monitor wildlife and their habitats in and along the Potomac River near the Airport. These agencies work cooperatively to ensure the continued survival of the District of Columbia's and the State of Virginia's natural diversity. This setting contains a diversity of aquatic and terrestrial habitats for fish, wildlife, and plants. Many identified species could exist, or have been observed, within this setting. Some of those species have been listed as endangered, threatened, or species of concern by the FWS, VDGIF, or the VDCR. While many of these species could be present within the general vicinity, no known site-specific studies confirm that these endangered, threatened, or species of concern use the habitats on or immediately adjacent to the Airport other than on an occasional-transient basis.

As noted in Section 5.3.2, the Proposed Action is not expected to cause significant impacts to biological resources. Construction-related impacts to these resources resulting from the Proposed Action and Cumulative Impact Actions would be temporary and insignificant.

5.15.4.3 Climate

As discussed in Section 5.4.2, the Proposed Action would not increase fuel burn GHG emissions over the No Action Alternative. Similarly, the Cumulative Impact Actions would not increase fuel consumption, and GHG emissions would not be significant.

5.15.4.4 Coastal Resources

There are no coastal barrier resources in the vicinity of the Cumulative Impact Actions. As noted in Section 5.5.2, the Proposed Action is not expected to result in a significant impact to coastal resources. Construction-related impacts to coastal resources are expected to be insignificant.

5.15.4.5 Department of Transportation Act, Section 4(f) and Section 6(f) Lands

As noted in Section 5.6.2, there are no Section 6(f) lands on the Airport. The Cumulative Impact Actions would not occur on or adjacent to Section 4(f) resources and would not require a direct or indirect taking, or result in a constructive use, of Section 4(f) resources. Construction-related impacts to DOT Sections 4(f) and 6(f) lands would not occur.

5.15.4.6 Hazardous Materials, Solid Waste, and Pollution Prevention

The entire Airport area south of Levee Road and east of the Ogden Equipment Building is referred to as the South Investigation Site, or SIS. The SIS is listed on the Federal Agency Hazardous Waste Compliance Docket and has not yet received the designation of “No Further Remedial Action Planned” from the EPA. The SIS is being investigated by the FAA to characterize the nature and extent of contamination and whether further remedial action is warranted. If the Cumulative Impact Actions disturb the SIS, all material excavated from the SIS would be disposed of off-airport and tested prior to disposal. Any material found to be hazardous would be disposed of in accordance with federal and state requirements.

Petroleum products would be used to power and lubricate the construction equipment used for each of the Cumulative Impact Actions. *Standards for Specifying Construction of Airports* requires that the contractor:

...take necessary precautions to prevent pollution of streams, lakes, ponds, and reservoirs with fuels, oils, bitumens, chemicals, or other harmful materials and to prevent pollution of the atmosphere from particulate and gaseous matter.⁴⁶

In support of this requirement, the Advisory Circular also contains contract provisions for construction controls to prevent air and water pollution. Construction-related cumulative impacts would be temporary and insignificant.

5.15.4.7 Historic, Archaeological, Architectural, and Cultural Resources

As noted in Section 5.8.2, on-airport resources consist of structures and an archaeological site within the terminal and hangar areas. The nearest off-airport resource is the GWMP. These resources are beyond the LOPD of the Cumulative Impact Actions. Considering that the peninsula on which the airfield was constructed is predominantly manmade, and the landside facilities are heavily developed, there is very little potential for any as-yet-unknown resources to be affected.

5.15.4.8 Land Use

All of the Cumulative Impact Actions would occur on Airport property. Construction-related noise impacts would be temporary and insignificant, so compatible land-use impacts resulting from the construction noise of the Proposed Action and the Cumulative Impact Actions would not be considered significant.

5.15.4.9 Natural Resources and Energy Supply

As noted in Section 5.10.2.1, the Proposed Action would not cause a significant impact on natural resources or energy supplies. The improvements included in the Cumulative Impact Actions would not use scarce or rare materials for construction. Materials of the major project elements are assumed to be readily available. Construction-related impacts to natural resources and energy supply are not anticipated to occur.

⁴⁶ FAA, AC 150/5300-10G, Paragraph 70-19, July 21, 2014.

5.15.4.10 Noise

As reported in Section 5.11.2, the Proposed Action would not result in changes to aircraft noise impacts. The other Cumulative Impacts Projects do not involve aircraft operations.

5.15.4.11 Socioeconomic Impacts, Environmental Justice, and Children's Health and Safety

The Cumulative Impact Actions would not affect off-airport development, result in noise impacts to noise-sensitive facilities, or cause a change in the number of aircraft operations at the Airport. The Cumulative Impact Actions are not expected to affect local or regional growth plans. The Cumulative Impact Actions would not affect the surrounding community by causing shifts of or growth in population, increased public service demands, or changed business or economic activity. Construction-related secondary (induced) impacts are not anticipated to occur.

Section 5.12.2 documents that the Proposed Action would not cause socioeconomic impacts, environmental impacts, or risks to children's health and safety. No residences, businesses, or other noise-sensitive facilities would be affected by construction-related noise from the Cumulative Impact Actions. The relocation of residences or businesses would not be required; existing and planned communities would not be affected; and disproportionate impacts on low-income or minority populations would not occur. The Cumulative Impact Actions would not increase the capacity of the Airport or involve improvements to Airport or local roadways that would change surface traffic. The Cumulative Impact Actions would not result in potential impacts to air quality or water quality; therefore, no air quality or water quality impacts to low-income or minority populations or risks to children's health or safety would be anticipated.

5.15.4.12 Visual Effects

As noted in Section 5.13.2, the Proposed Action is not expected to cause significant light emission or visual impacts. The Proposed Action would involve minor lighting changes associated with the NNC and Secure National Hall. The new or modified airfield lighting would not be discernible against the background of existing airfield lighting. Similarly, the Cumulative Impact Actions would involve minor lighting changes. The Cumulative Impact Actions would be visually consistent with existing on-Airport airfield features. Construction-related light emission and visual impacts from the Proposed Action and Cumulative Impact Actions would be insignificant.

5.15.4.13 Water Resources

Wetlands

No vegetated wetlands or stream channels regulated by the ACE, VDEQ, or VMRC are located on Airport land within the LOPD. The Proposed Action would not impact wetlands or WOTUS.

The construction-related cumulative impacts on wetlands and WOTUS would be temporary and insignificant.

Floodplains

The Proposed Action would not include construction or encroachment within the 100-year floodplain. The Proposed Action would not affect flood elevations on adjacent properties, either upstream or downstream of

the Airport. The expansion of Runway 1 Hold Apron and Pad Bravo appear to be within the 100-year floodplain. FAA design criteria dictate specific geometries for runways, taxiways, and aprons, including allowable pavement profiles and cross slopes. The hold apron and Pad Bravo would be designed in accordance with these criteria. To keep the pavement free of standing water, the stormwater management systems would be designed to meet the frequency of the design runoff event as specified in *Airport Drainage Design*.⁴⁷ Although this fill could theoretically result in a loss of floodplain storage volume, because of the ± 3 -foot tidal range of the Potomac, any potential impacts would be indiscernible on Airport property. The cumulative impacts of the Proposed Action and Cumulative Impact Actions would not affect flood elevations on adjacent properties, either upstream or downstream of the Airport. Construction-related impacts to floodplains would be insignificant.

Surface Waters and Groundwater

As with the Proposed Action, the Cumulative Impact Actions would be implemented using appropriate procedures to control soil erosion and decrease potential inputs of chemical nutrients and sediments to the adjacent receiving waters. The Authority's erosion and sediment control program requires that all land-disturbing activities have erosion and sediment control measures in place in accordance with the *Virginia Erosion and Sediment Control Handbook*. The individuals who administer the Authority's compliance with this handbook and the Virginia Erosion and Sediment Control Law have been certified by the VDEQ. A Virginia Pollutant Discharge Elimination System General Permit for Construction Activities would be required from the VDEQ. This permit would require the construction site operator to develop and implement an SWPPP that uses best management practices for erosion and sediment control at the construction site. The permitting process allows applicants to satisfy identical pollution prevention plan requirements by simply referencing the approved Erosion and Sediment Control Plan. All construction plans and contracts would be prepared in accordance with *Standards for Specifying Construction of Airports*, which includes requirements for temporary air and water pollution, soil erosion, and siltation control.⁴⁸ All necessary erosion and sediment control measures would be implemented prior to beginning each element of construction. In accordance with the Airport's NPDES permit, any construction-related stormwater discharges into the Potomac River would require a Notice of Intent to be filed with the EPA.

The Cumulative Impact Actions includes installation of glycol storage, handling, and distribution system designed to capture spent deicing fluids before they reach surrounding waterways. By capturing the deicing fluids before they reach surface waters, this project would be a water quality improvement project. The construction-related cumulative impacts on water quality would be temporary and insignificant.

The centralized deicing plans would not create any additional stormwater outfalls. Each "centralized" pad would be isolated from other areas. The platform would be graded and grooved to channel runoff to a collection system. The collected stormwater would then be stored for disposal. Storage times would vary based on the intensity and duration of the storm event. The collected water/deicing fluids would be

⁴⁷ FAA, AC 150/5320-5C, August 15, 2013.

⁴⁸ FAA AC 150/5370-10G, July 21, 2014.

transported to Washington Dulles International Airport for further treatment (where the fluid is concentrated, and water is removed), as is the current practice. The concentrate would then be taken to offsite recycling facilities.

With the closest groundwater recharge area located west of I-395, near Arlington National Cemetery, the Cumulative Impact Actions would have no adverse effect on groundwater resources. The construction-related cumulative impacts on water quality would be temporary and insignificant.