I. Summary

1.1 Introduction

The Federal Aviation Administration (FAA) owns and the Metropolitan Washington Airports Authority (the Authority) operates Ronald Reagan Washington National Airport (the Airport), which occupies approximately 733 acres of land and 127 acres of water situated along the western shore of the Potomac River in the Commonwealth of Virginia. The Airport is located in Arlington County, immediately north of the City of Alexandria, Virginia, and across the Potomac River from Washington, D.C. The regional setting of the Airport is shown on **Exhibit I-1**. There are three runways at the Airport: primary Runway 1-19 and crosswind Runways 15-33 and 4-22. Approximately 85 percent of aircraft operations, i.e., arrivals and departures, occur on Runway 1-19. The current Airport Layout Plan (ALP) is shown on **Exhibit I-2**.

The Authority is preparing this Environmental Assessment (EA) of potential environmental impacts associated with proposed enhancements to the Runway 1-19 Runway Safety Area (RSA) and the Runway 1 Hold Apron and related improvements at the Airport (together, the Proposed Action). An RSA provides a measure of safety in the event of an aircraft excursion from the runway by significantly reducing the extent of personal injury and aircraft damage during overruns, undershoots, or veer-offs. A hold apron helps improve the management of aircraft flow on the ground by providing an area for the FAA Airport Traffic Control Tower (ATCT) staff to hold aircraft not ready for departure while allowing other aircraft to taxi to a runway.

This EA is being prepared pursuant to the requirements and guidelines of FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures*, FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions,* and the FAA *Environmental Desk Reference for Airport Actions*.

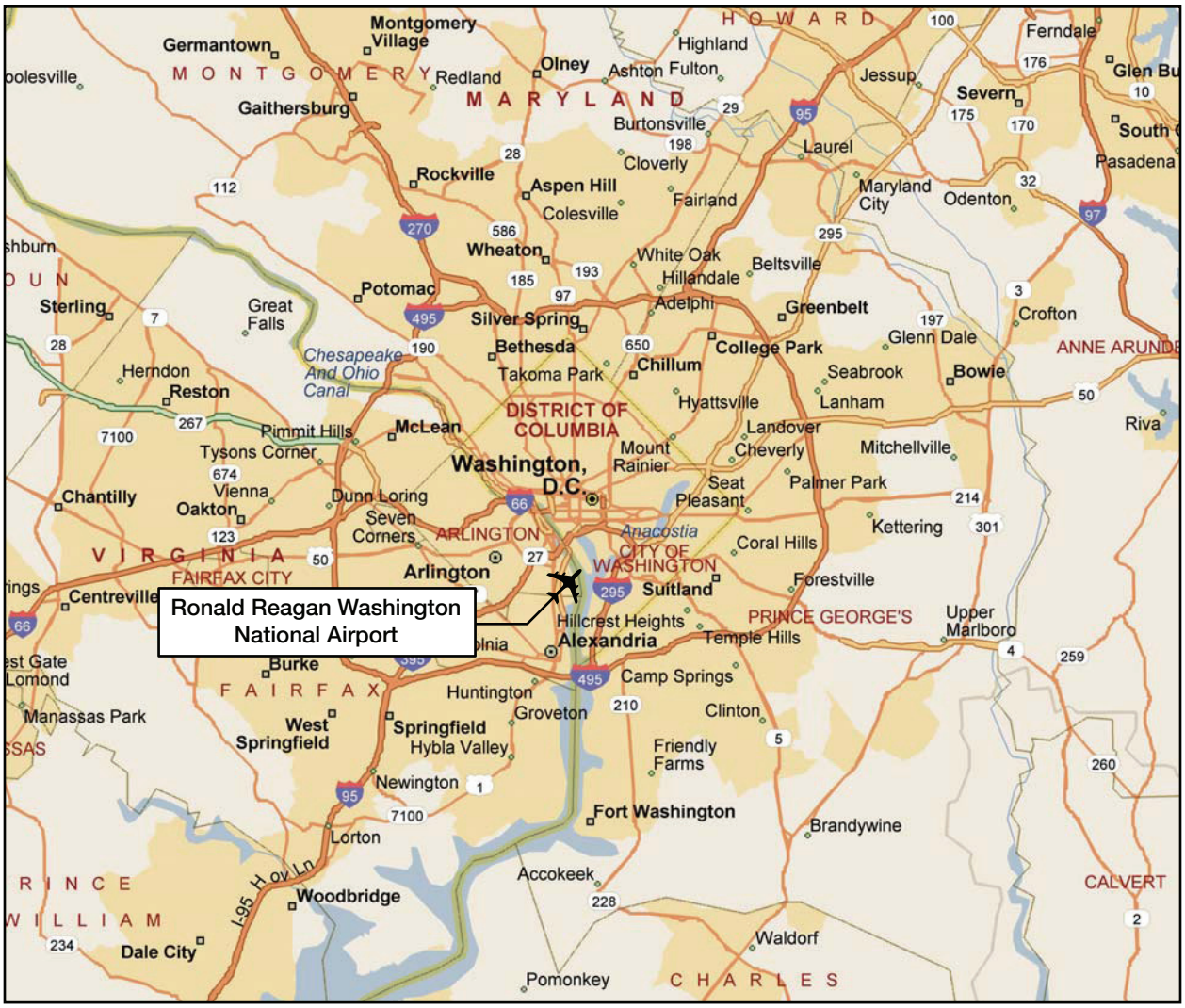
1.2 Purpose and Need

Detailed information on the Purpose and Need for the Proposed Action is presented in Section II.

The FAA has determined that the Runway 1 RSA extends beyond the northern end of Runway 1-19 by 750 feet, which falls short of the 1,000-foot FAA design standard. As operator of the Airport, a Federally obligated airport certificated under 14 Code of Federal Regulations (CFR) Part 139, *Certification of Airports*, the Authority is obligated by FAA Order 5200.8, *Runway Safety Area Program*, and the U.S. Department of Transportation (DOT) Appropriations Act for Federal Fiscal Year (FFY) 2006 (ended September 30, 2006), to comply with FAA regulatory requirements for RSAs by FFY 2015. The existing nonstandard RSA is shown on **Exhibit I-3**.

The size of the current Runway 1 Hold Apron does not provide sufficient area for the largest aircraft operating at the Airport to bypass aircraft on the Hold Apron, and thereby limits its function to the queuing of aircraft awaiting departure. In addition, the Authority's proposed solution to the deficient Runway 1-19 RSA requires using a portion of the Runway 1 Hold Apron for the extension of Taxiway J. Insufficient Runway 1 Hold Apron capacity exacerbates delays at the Airport and throughout the National Airspace System.

THIS PAGE LEFT INTENTIONALLY BLANK



Source: MapPoint 2004.
Prepared by: Ricondo & Associates, Inc., October 2008.

Exhibit I-1

Not to Scale north

Regional Setting

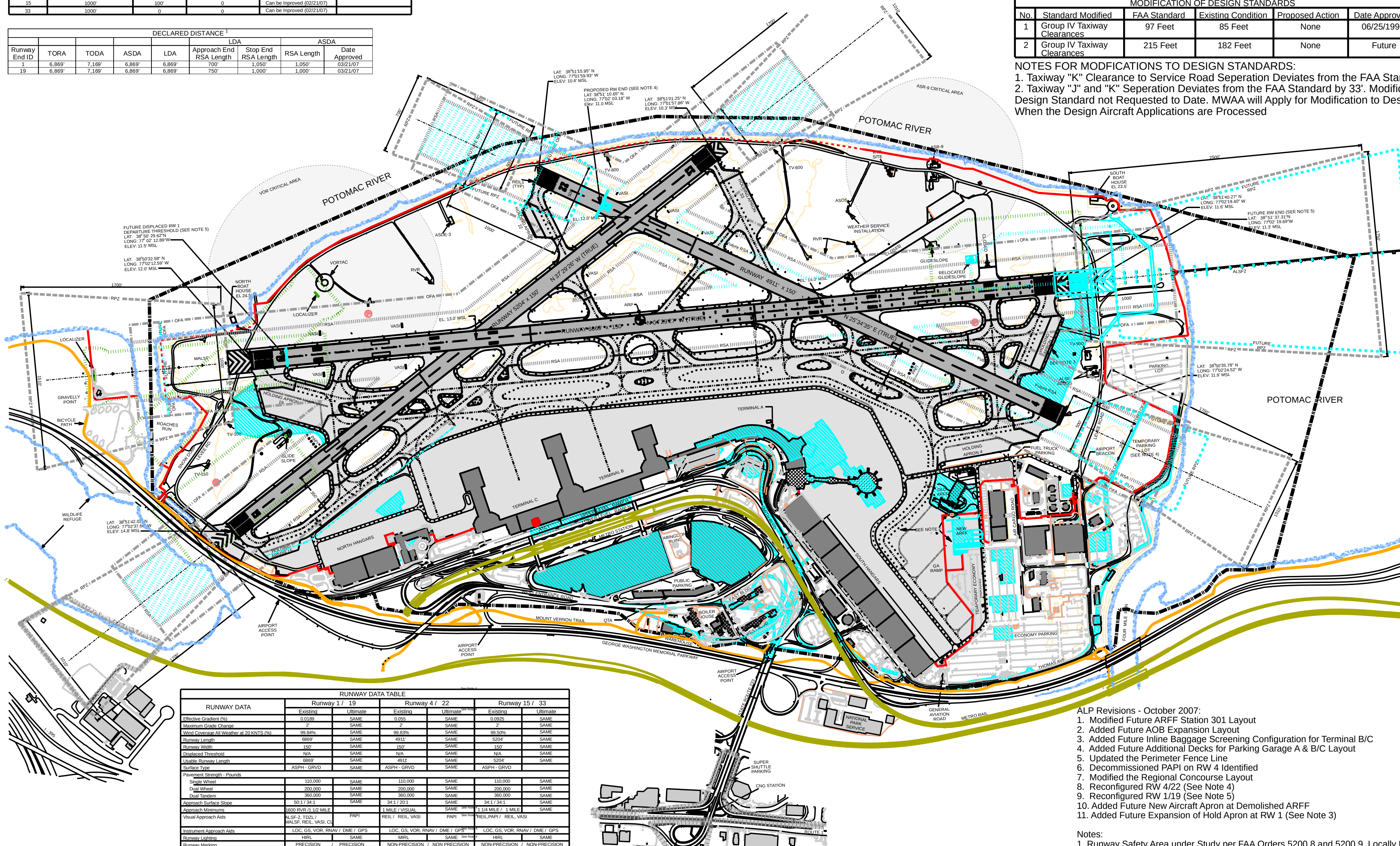
THIS PAGE LEFT INTENTIONALLY BLANK

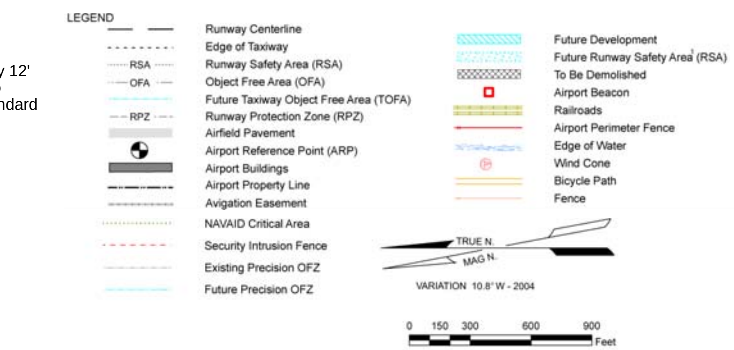
RUNWAY SAFETY AREA DETERMINATION [1]					
Runway End ID.	Standard RSA Length beyond Runway	Actual RSA Length beyond RWY	Actual RSA Violations to RSA along side of RWY	RSA Determination	Date Approved
1	1000'	1000'	0	Can be Inproved (02/21/07)	03/21/07
19	1000'	750'	0	Can be Inproved (02/21/07)	03/21/07
4	1000'	936'	0	Can be Inproved (02/21/07)	
22	1000'	0	0	Can be Inproved (02/21/07)	
15	1000'	100'	0	Can be Inproved (02/21/07)	
33	1000'	0	0	Can be Inproved (02/21/07)	

DECLARED DISTANCE [1]					LDA		ASDA	
Runway End ID	TORA	TODA	ASDA	LDA	Approach End RSA Length	Stop End RSA Length	RSA Length	Date Approved
1	6,869'	7,169'	6,869'	6,869'	700'	1,050'	1,050'	03/21/07
19	6,869'	7,169'	6,869'	6,869'	750'	1,000'	1,000'	03/21/07

MODIFICATION OF DESIGN STANDARDS					
No.	Standard Modified	FAA Standard	Existing Condition	Proposed Action	Date Approved
1	Group IV Taxiway Clearances	97 Feet	85 Feet	None	06/25/1990
2	Group IV Taxiway Clearances	215 Feet	182 Feet	None	Future

NOTES FOR MODFICATIONS TO DESIGN STANDARDS:
1. Taxiway "K" Clearance to Service Road Seperation Deviates from the FAA Standard by 12'
2. Taxiway "J" and "K" Seperation Deviates from the FAA Standard by 33'. Modification to Design Standard not Requested to Date. MWAA will Apply for Modification to Design Standard When the Design Aircraft Applications are Processed





RUNWAY DATA TABLE						
RUNWAY DATA	Runway 1 / 19 Existing	Runway 1 / 19 Ultimate	Runway 4 / 22 Existing	Runway 4 / 22 Ultimate	Runway 15 / 33 Existing	Runway 15 / 33 Ultimate
Effective Gradient (%)	0.0189	SAME	0.055	SAME	0.0925	SAME
Maximum Grade Change	2'	SAME	2'	SAME	2'	SAME
Wind Coverage All Weather at 20 KNTS (%)	99.84%	SAME	99.83%	SAME	99.50%	SAME
Runway Length	6869'	SAME	4911'	SAME	5204'	SAME
Runway Width	150'	SAME	150'	SAME	150'	SAME
Displaced Threshold	N/A	SAME	N/A	SAME	N/A	SAME
Usable Runway Length	6869'	SAME	4911'	SAME	5204'	SAME
Surface Type	ASPH - GRVD	SAME	ASPH - GRVD	SAME	ASPH - GRVD	
Pavement Strength - Pounds						
Single Wheel	110,000	SAME	110,000	SAME	110,000	SAME
Dual Wheel	200,000	SAME	200,000	SAME	200,000	SAME
Dual Tandem	360,000	SAME	360,000	SAME	360,000	SAME
Approach Surface Slope	50:1 / 34:1	SAME	34:1 / 20:1	SAME	34:1 / 34:1	SAME
Approach Minimums	1600 RVR /1 1/2 MILE		1 MILE / VISUAL	SAME See Note 4	1 1/4 MILE / 1 MILE	SAME
Visual Approach Aids	ALSF-2, TDZL / MALSF, REIL, VASI, CL	PAPI	REIL / REIL, VASI	PAPI See Note 4	REIL,PAPI / REIL, VASI	
Instrument Approach Aids	LOC, GS, VOR, RNAV / DME / GPS		LOC, GS, VOR, RNAV / DME / GPS See Note 4		LOC, GS, VOR, RNAV / DME / GPS	
Runway Lighting	HIRL	SAME	MIRL	SAME See Note 4	HIRL	SAME
Runway Marking	PRECISION /	PRECISION	NON-PRECISION /	NON PRECISION	NON-PRECISION /	NON-PRECISION
Runway Object Free Area (OFA)						
Length Beyond Runway	1000' / 750'	1000' / 1050'	936' / 0	SAME	100 / 0	SAME
Width	800'	SAME	800'	SAME	800'	SAME
Runway Safety Area						
Length Beyond Runway	1000' / 750'	1000' / 1050'	936' / 0	SEE NOTE 1	100' / 0	SEE NOTE 1
Width	500'	SAME	500'	SAME	500'	SAME
Runway End Coordinates (NAD 83)						
Lattitude	1: 38 51'40.27"	1: 38 51' 37.31"	4: 38 50'35.77"	SAME See Note 4	15: 38 51'42.02"	SAME
	19: 38 50'32.58"	SAME	22: 38 51'15.95"	SAME	33: 38 51'01.25"	SAME
Longitude	1: 77 02'19.40"	1: 77 02' 19.69"	4: 77 02'24.52"	SAME	15: 77 02'37.66"	SAME
	19: 77 02'12.59"	SAME	22: 77 01'59.93"	SAME	33: 77 01'57.86"	SAME
Runway End Elevation (MSL)	11.6' / 12'	11.6' / 11.3'	11.9' / 10.6'	SAME	14.8' / 10.3'	SAME
Displaced Threshold Elevation (MSL)	N/A	SAME	N/A	SAME	N/A	SAME
TDZ Elevation (MSL)	15' / 14'	SAME	14' / 14'	SAME	15' / 13'	SAME
Airport Reference Code (ARC)	C - IV	SAME	C - III	SAME	C - III	SAME
Critical Aircraft	757	767	737-800	757	757	757
Stage Length	1998 NM	SAME	1998 NM	SAME	1998 NM	SAME

ALP Revisions - October 2007:
1. Modified Future ARFF Station 301 Layout
2. Added Future AOB Expansion Layout
3. Added Future Inline Baggage Screening Configuration for Terminal B/C
4. Added Future Additional Decks for Parking Garage A & B/C Layout
5. Updated the Perimeter Fence Line
6. Decommissioned PAPI on RW 4 Identified
7. Modified the Regional Concourse Layout
8. Reconfigured RW 4/22 (See Note 4)
9. Reconfigured RW 1/19 (See Note 5)
10. Added Future New Aircraft Apron at Demolished ARFF
11. Added Future Expansion of Hold Apron at RW 1 (See Note 3)

Notes:
1. Runway Safety Area under Study per FAA Orders 5200.8 and 5200.9. Locally Preferred Alternative Expected In 2008
2. ARFF Station 301 to be Relocated in 2007 - 2008. Old Building to be Demolished and Future Landuse Determined as Airfield. The Relocation of Non-Movement Area Marking and Vehicular Lanes to be Addressed After a Detailed Study
3. Configuration and Expansion of Hold Apron for RW 1 is Under Study by MWAA. Final Recommended Layout Expected In 2008
4. RW 4/22 ARC Will Temporarily be Changed From C - III to B - III to Accommodate Opening of Interim Parking Near Approach End of RW 4. The New RW Length Will be 4315' the New OFA Width and Length would be 800' x 600', RSA Width and Length 300' x 600'
(This Is Temporary for 2 - 5 Years Depending on the Daily Garage Expansion Project)
5. RW 1/19 will be Reconfigured to Ensure 1000' of RSA are Available at Both RW Ends. 300' of Pavement Would be Added to the South End and the North Departure Threshold Would be Moved 300' to the South to Attain 1000' and 1050' of RSA Respectively. A Taxiway Would be Added to the South End for Access to the New RW End. Also, the Glide Slope Would be Moved to Support the New RW End

Source: Metropolitan Washinton Airports Authority, Office of Engineering, 2007.
Prepared by: Ricondo & Associates, Inc, November 2008

Exhibit I-2

Not to Scale

Airport Layout Plan

THIS PAGE LEFT INTENTIONALLY BLANK

Source: Ricondo & Associates, Inc., July 2008.
Prepared by: Ricondo & Associates, Inc., July 2008.

Exhibit I-3

0 1,200 ft.

north

Runway 1-19 Nonstandard Runway Safety Area

Drawing: Z:\MWAA\DCA\RSA EAs\Task 1-RW 1-19\1.2 PDEA Number 1\AutoCAD Files\Exhibit I-3 Runway 1-19 Nonstandard Runway Safety Area.dwg Layout: 8.5 x 11L Jun 10, 2009, 11:52am

THIS PAGE LEFT INTENTIONALLY BLANK

The Authority's Pavement Management System and inspections of the condition of the Runway 1-19 pavement indicate that an overlay will be needed within the next several years.

The Authority has determined that constructing a standard RSA, expanding the Runway 1 Hold Apron, and resurfacing Runway 1-19 is a reasonable, practicable, and feasible solution. The Proposed Action includes the various improvements necessary to implement this solution.

1.2.1 Proposed Action

The Proposed Action is described in detail in Section 2.3 and includes the key elements listed below:

- Extension of the Runway 1-19 pavement 300 feet to the south;
- Expansion of the Runway 1 Hold Apron;
- Relocation of electrical vault TV-900 to a tentative site on a paved area south of Levee Road in the vicinity of the Airport Beacon and the installation of a new ductbank along Levee Road from the relocated vault to the general area of the existing vault.;
- Extension of the Taxiway J pavement 300 feet to the south;
- Designation of declared distances to maintain Runway 1-19 at its current effective length of 6,869 feet in both directions;
- Relocation of the existing Runway 1 approach lighting system 300 feet to the south;
- Relocation of the glide slope antenna;
- Rerouting of the existing service road;
- Grading and soil stabilization; and
- Resurfacing of Runway 1-19.

Each of the above elements would be implemented on Airport property with the exception of the approach lights. The 800-, 900-, and 1,000-foot approach light bars would be relocated to positions on a pier structure within the Airport boundary that currently supports a portion of the approach lighting system and would require new pilings in the Potomac River on Airport property for additional support. Three relocated centerline bars and sequenced flashing lights would be placed on a portion of the same FAA pier structure, which extends outside of the Airport's property line.

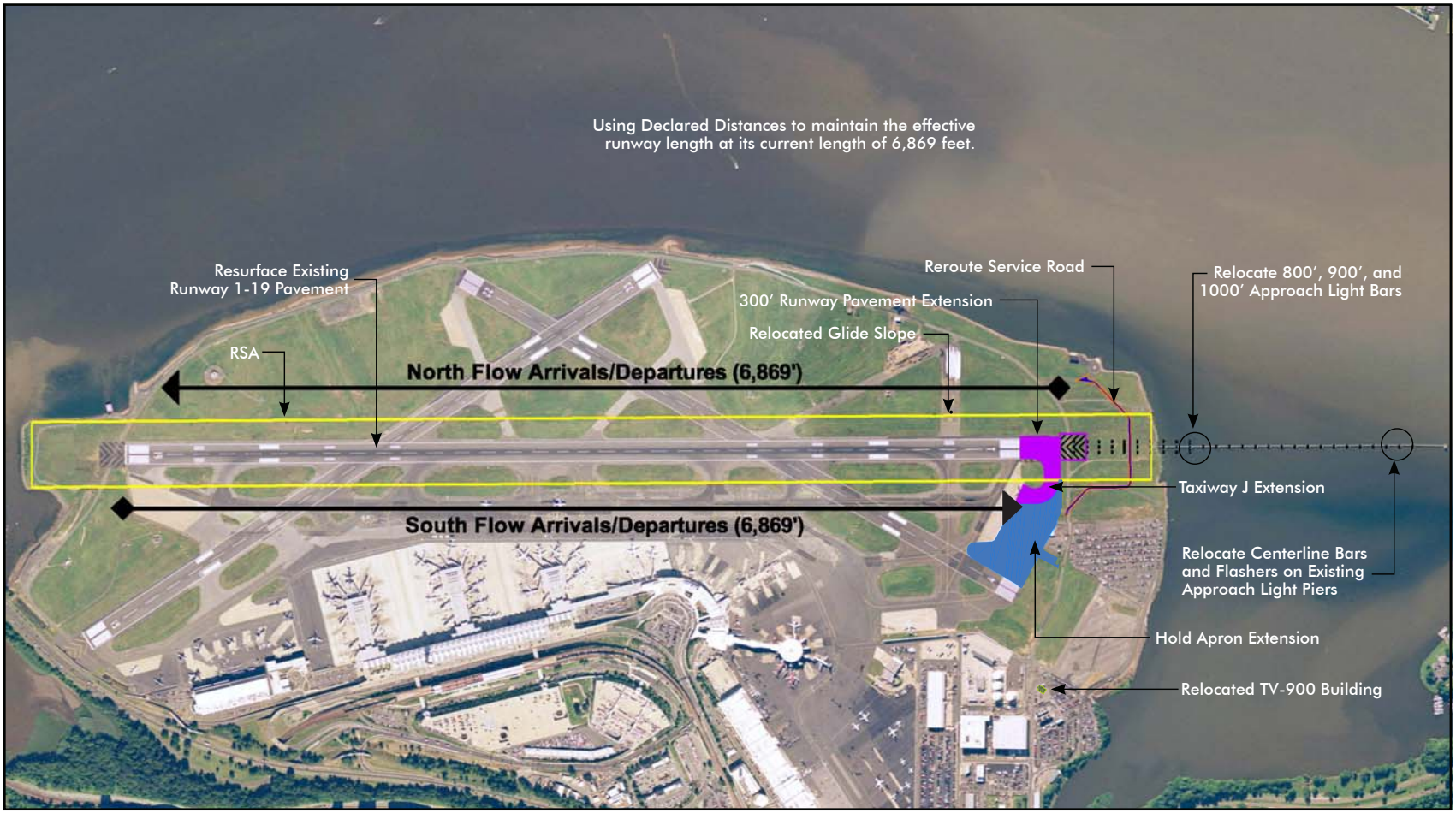
Exhibit I-4 illustrates the elements of the Proposed Action.

1.2.2 Federal Actions

Detailed information on the federal (i.e., FAA) actions being requested by the Authority and the FAA's authority to take such actions is presented in Section 2.4. The requested actions include:

- Unconditional approval of the Airport's ALP depicting the proposed airfield;
- Determinations relating to the eligibility of the proposed projects for federal funding under the Airport Improvement Program (AIP);
- Determination that the Proposed Action is reasonably necessary for use in air commerce or in the interest of national defense;
- Establishment of flight procedure modifications;

THIS PAGE LEFT INTENTIONALLY BLANK



Source: Aerials Express, 2007 (Aerial); Ricondo & Associates, Inc., July 2008 (Proposed Action Improvements).
Prepared by: Ricondo & Associates, Inc., July 2008.

Exhibit I-4

Not to Scale

north

The Proposed Action

THIS PAGE LEFT INTENTIONALLY BLANK

- Determination that the proposed airfield development projects would meet federal Clean Air Act (CAA) requirements;
- Continued close coordination with the Authority and appropriate FAA program offices as required to ensure safety during construction;
- Approval of the appropriate amendments to the *Airport Certification Manual*;
- Appropriate amendment to air carrier operating specifications;
- Determination that the Proposed Action is reasonably necessary for use in airspace;
- A determination of the effects on safe and efficient use of airspace, including a review of changes to air traffic procedures for consistency with the Potomac Terminal Radar Approach Control (TRACON) Environmental Impact Statement; and
- Relocation of navigational aids, including runway approach lights.

1.2.3 Timeframe of the Proposed Action

The Authority currently expects to submit the Final EA to the FAA in September 2009 and anticipates that the FAA could issue its finding in October 2009. The Authority plans to concurrently construct the RSA and hold apron enhancements, and estimates that it will take up to 18 months to complete construction. If the EA schedule is met and the FAA issues a favorable finding, and if construction commences in the second quarter of 2010, construction would likely be completed in the third quarter of 2011. The resurfacing of Runway 1-19 is expected to occur after the construction of the RSA enhancement and the hold apron expansion.

1.3 Alternatives

A detailed discussion of the identification and evaluation of alternatives is presented in Section III.

FAA Order 5200.8 identifies the alternatives that must be analyzed when an RSA does not comply with applicable FAA Advisory Circular (AC) 150/5300-13, *Airport Design*, standards. Those alternatives are to:

- Construct a standard RSA;
- Relocate, shift, and/or realign the runway;
- Reduce the length of the runway;
- Implement a combination of relocating, shifting, and/or realigning the runway and reducing runway length;
- Use declared distances; and
- Use Engineered Material Arresting Systems (EMAS).

Declared distances are the distances an airport owner declares available for an airplane's take-off run, take-off distance, accelerate-stop distance, and landing distance requirements.[1] EMAS "uses materials of closely controlled strength and density placed at the end of a runway to stop or greatly slow an aircraft that overruns the runway. The best material found to date is a lightweight, crushable

[1] Federal Aviation Administration, Advisory Circular 150/5300-13, *Airport Design*, Paragraph 2.

concrete. When an aircraft rolls into an EMAS arrestor bed, the tires of the aircraft sink into the lightweight concrete and the aircraft is decelerated by having to roll through the material."[2]

Within the context of the requirements of FAA Order 5200.8 and FAA AC 150/5300-13, the Authority conducted a number of studies to consider various RSA enhancement and Runway 1 Hold Apron scenarios in terms of operational capabilities, potential environmental impacts, effectiveness, and practicability. A summary of the planning alternatives is presented in Sections 3.2.2 and 3.2.3. Building on the planning alternatives, the Authority developed and evaluated preliminary EA alternatives. One difference between alternatives identified in previous studies and the Preliminary EA alternatives is that each Preliminary EA build alternative includes expansion of the Runway 1 Hold Apron and resurfacing of Runway 1-19. These preliminary EA alternatives are summarized below:

- Alternative 1 combines several planning alternatives that extend the Runway 1 RSA 250 feet beyond the north end of Runway 1-19 by placing fill or constructing a pier in Roaches Run. Operationally these alternatives are the same; they differ in how Roaches Run would be affected.
- Alternative 2 combines two planning alternatives that extend the Runway 1 RSA 250 feet beyond the north end of Runway 1-19 by shifting the entire runway 250 feet to the south and replacing 250 feet of the RSA lost on the south end of the runway by placing a pier or fill in the Potomac River near the mouth of Four Mile Run. Operationally, the alternatives are the same, with the only difference being how the Potomac River would be affected.
- Alternative 3 incorporates declared distances to effectively reduce the landing and takeoff distances available for Runway 1 by 300 feet.
- Alternative 4 would extend the Runway 1 pavement 300 feet to the south and incorporate declared distances for Runway 1 and Runway 19 to maintain the current available landing and takeoff distances at 6,869 feet in each direction. This alternative was developed by modifying a planning alternative to minimize relocation impacts on the runway's approach lighting system.
- Alternative 5 is a refined EMAS alternative (Alternatives E1 and E2) that would use an EMAS bed 425 feet long and 150 feet wide located 175 feet from the Runway 19 threshold.
- Alternative 6 is the No Action alternative that must be considered in the EA pursuant to Council on Environmental Quality (CEQ) regulations and FAA Orders 1050.1E and 5050.4B.

Table I-1 presents a comparison of the preliminary EA alternatives.

Evaluation of the preliminary EA alternatives is provided in Section 3.4. Alternative 4 was selected as the preferred alternative and, therefore, is the only build alternative considered in detail in this EA. The No Action alternative is carried forward in the EA pursuant to CEQ regulations and FAA Orders 1050.1E and 5050.4B.

1.4 Affected Environment

A detailed discussion of the affected environment is presented in Section IV. Relevant portions of Section IV that provide more detailed information are noted in parentheses next to the section headings below.

[2] Federal Aviation Administration, *Fact Sheet – Engineered Material Arresting System,* August 11, 2008.

Table I-1

Preliminary EA Alternatives Comparison

	Alternatives					
Key Elements	1	2	3	4	5	6
Runway Variations (feet)						
Extend Runway 1 Pavement		250		300		
Shorten Runway 19 Pavement						
Effective Runway 1 Landing Length	6,869	6,869	6,569	6,869	6,869	6,869
Effective Runway 1 Takeoff Length	6,869	6,869	6,569	6,869	6,869	6,869
Effective Runway 19 Landing Length	6,869	6,869	6,869	6,869	6,869	6,869
Effective Runway 19 Takeoff Length	6,869	6,869	6,869	6,869	6,869	6,869
Fill/Pier in River Variations						
Place Fill or Pier in Roaches Run, Redirect Roaches Run, or Place Box Culverts in Roaches Run	Yes					
Relocate Boat Ramp	Yes					
Place Fill or Pier in Potomac River/Four Mile Run		Yes				
Declared Distances						
Runway 1 Landing			Yes	Yes		
Runway 1 Takeoff			Yes	Yes		
Runway 19 Landing				Yes		
Runway 19 Takeoff				Yes		
EMAS – Runway 19 (feet)						
Distance from Runway Threshold					175	
Length of EMAS					425	
Runway 1 Approach Lights Variations						
Relocate Approach Lights		Yes		Yes		
Expand Runway 1 Hold Apron	Yes	Yes	Yes	Yes	Yes	
Related Improvements Variations						
Additional Runway Edge Lighting				Yes		
Relocation of Runway 1 TDZ Lighting				Yes		
Extension of Taxiway Pavement				Yes		
Additional Taxiway Edge Lighting				Yes		
Rerouting of Service Road				Yes		
Relocation of Glide Slope Antenna				Yes		

TDZ = Touchdown Zone

Source: Ricondo & Associates, Inc., October 2008.
Prepared by: Ricondo & Associates, Inc. October 2008

1.4.1 Identification and Description of the Study Area

The study area generally includes the immediate environs of the Airport, with a particular focus on those areas that would be affected by the Proposed Action. The limits of physical disturbance (LOPD) are depicted on **Exhibit I-5**. **Exhibit I-6** illustrates the Airport environs.

THIS PAGE LEFT INTENTIONALLY BLANK

Source: Ricondo & Associates, Inc., July 2008.
Prepared by: Ricondo & Associates, Inc., July 2008.

Exhibit I-5

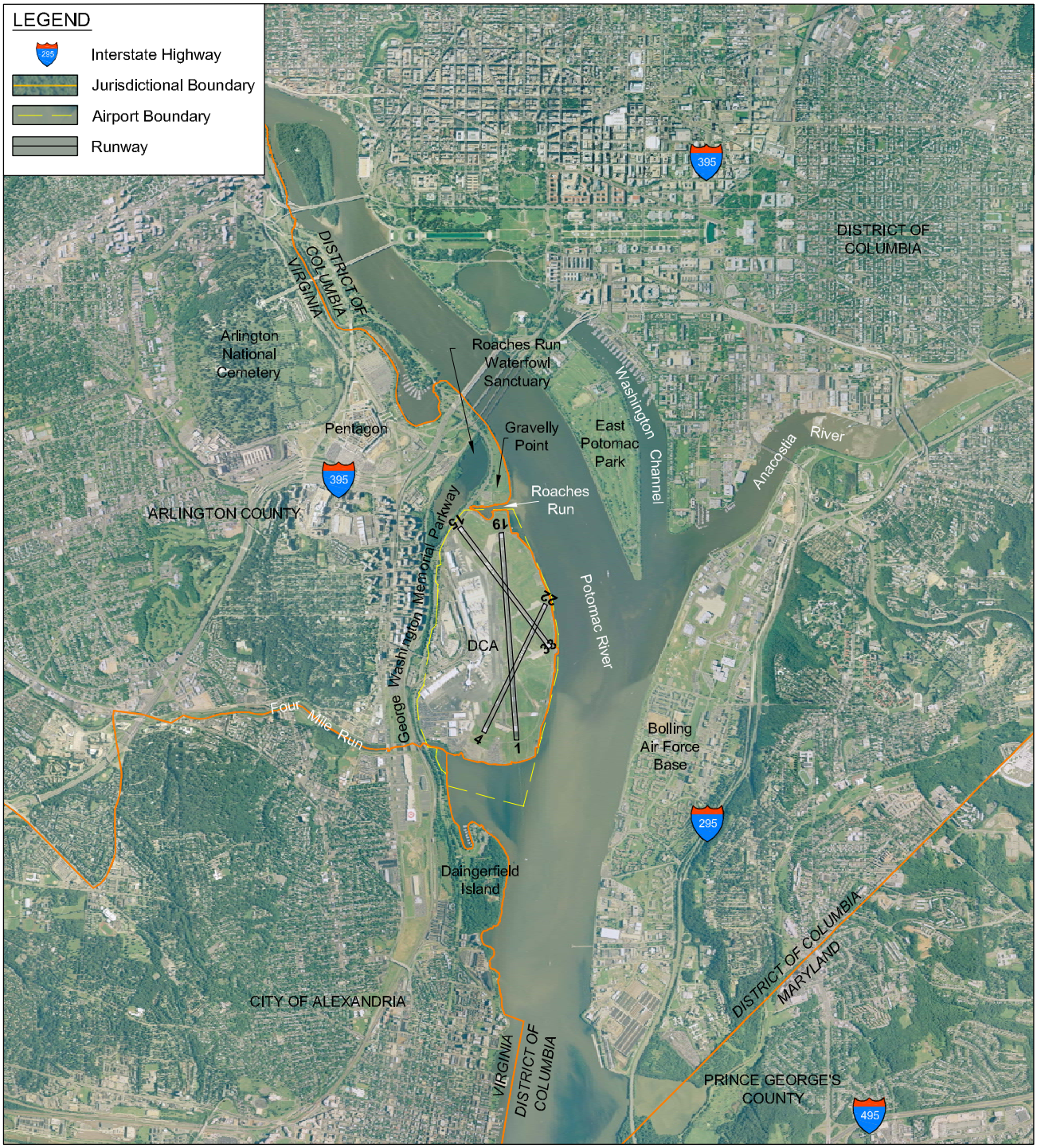
0 1,200 ft.

north

Limits of Physical Disturbance

Drawing: Z:\MWAA\DCA\RSA EAs\Task 1-RW 1-19\1.2 PDEA Number 1\AutoCAD Files\Exhibit I-5 Limits of Physical Disturbance.dwg Layout: 8.5 x 11L Jun 10, 2009, 11:55am

THIS PAGE LEFT INTENTIONALLY BLANK



Sources: AirPhotoUSA, 2001 (Aerial); Ricondo & Associates, Inc., September 2008.
Prepared by: Ricondo & Associates, Inc., October 2008.

Exhibit I-6

0 5,280 ft.

north

Airport Environs

Drawing: Z:\MWAA\DCA\RSA EAs\Task 1-RW 1-19\1.2 PDEA Number 1\AutoCAD Files\Exhibit I-6 Airport Environs.dwg Layout: 8.5x11-P Jun 10, 2009, 12:19pm

THIS PAGE LEFT INTENTIONALLY BLANK

1.4.2 Resources that Are Not Present in the Study Area

No prime, unique, or state significant farmlands are located on Airport property. The three water courses in the vicinity of the Airport—the Potomac River, Four Mile Run, and the Anacostia River—are not designated under the National Wild and Scenic River System as having remarkable scenic, recreational, geologic, fish, wildlife, historic, or cultural value, and the segments of these water courses in the vicinity of the Airport are not listed in the National Rivers Inventory as having "outstandingly remarkable" natural or cultural values judged to be of more than local or regional significance.

1.4.3 Human Environment

1.4.3.1 Local Jurisdictions (*see Section 4.3.1*)

As previously mentioned, the Airport is located in Arlington County, immediately north of the City of Alexandria, Virginia, and across the Potomac River from Washington, D.C. The District of Columbia has jurisdiction of the Potomac River waters up to the high water line, as the west bank of the river serves as the District's border with Virginia. Although the District does not have a local agency to manage public lands, it receives management assistance for land in the public domain from the National Park Service (NPS); thus, the Potomac River bed is managed by the NPS.

1.4.3.2 Existing Land Use (*see Section 4.3.2*)

The generalized existing land use pattern in the Airport environs is depicted on **Exhibit I-7**. Land use in the Airport environs is a mix of commercial, industrial, governmental, park and recreational, and residential uses.

1.4.3.3 Demographics and Socioeconomic Profile (*see Section 4.3.3*)

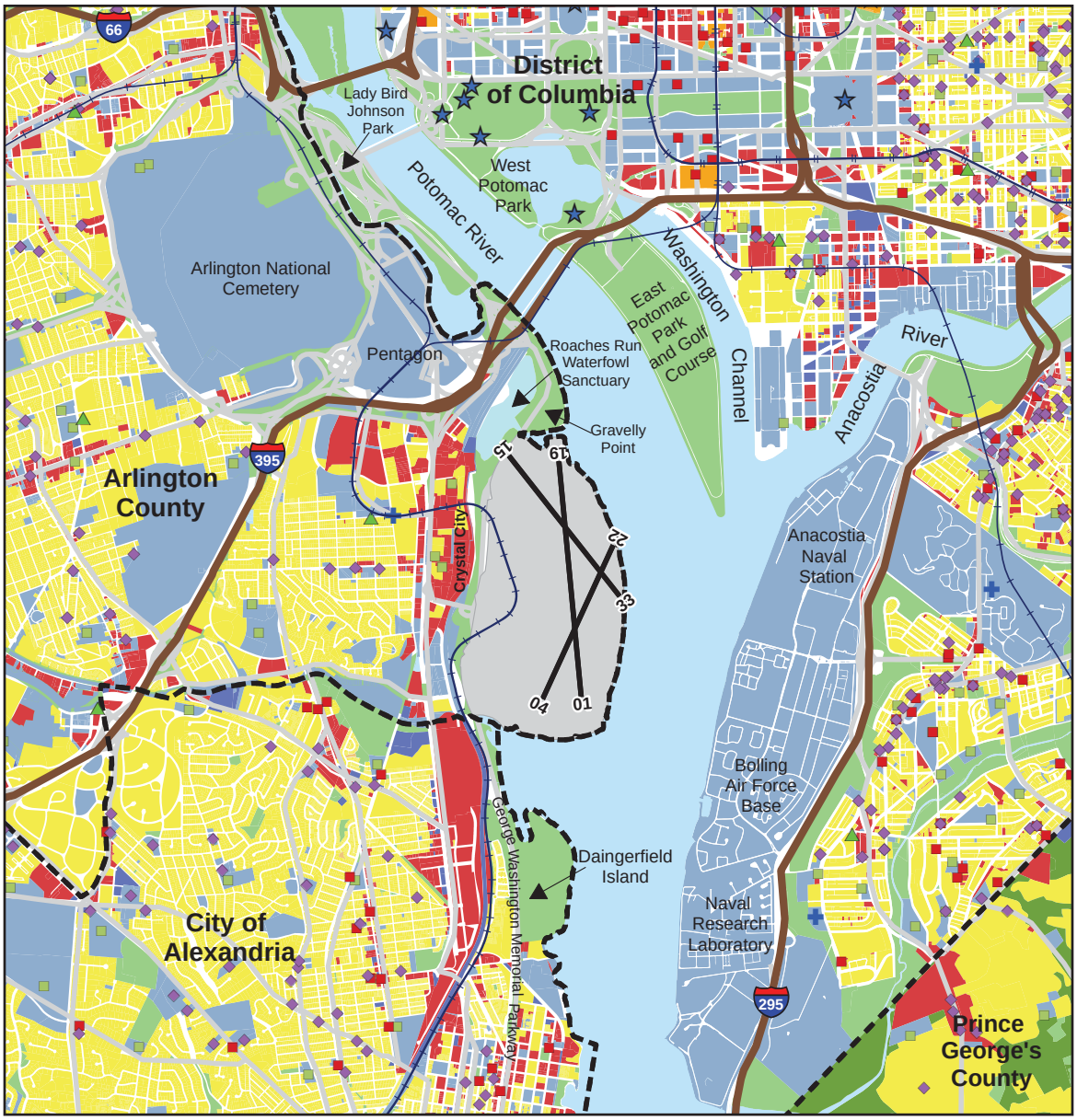
Demographic and socioeconomic data are presented in **Table I-2**.

1.4.3.4 U.S. DOT Act, Section 4(f) and 6(f) Resources (*see Section 4.3.4*)

U.S. DOT Act, Section 4(f) resources (i.e., George Washington Memorial Parkway [GWMP], Gravelly Point, Roaches Run Waterfowl Sanctuary, Mount Vernon Trail that runs parallel to the GWMP, Lady Bird Johnson Park, Daingerfield Island including the Washington Sailing Marina, and East Potomac Park and Golf Course) are shown on Exhibit I-7. The NPS and the Arlington County Department of Parks, Recreation, and Cultural Resources are cooperating on an Arlington County proposal to improve NPS park facilities that link the Arlington County North Tract Park of Gravelly Point and NPS lands. There are no Section 6(f) lands, national forests, wilderness areas, or wild and scenic rivers in the vicinity of the Airport.

The Potomac River, adjacent to the Airport, is listed as an American Heritage River by the U.S. Environmental Protection Agency (EPA). American Heritage Rivers are those that represent the natural, historical, cultural, social, and economic diversity of American waterways.

THIS PAGE LEFT INTENTIONALLY BLANK



LEGEND

- Hospital
- School
- Day Care
- Library
- Religious Facility
- Landmark
- Interstate Highway
- Jurisdictional Boundary
- Major Road
- Railroad
- Runways
- Residential
- Commercial
- Mixed Use
- Institutional/ Government
- Parks/Recreation
- Open Space
- Industrial
- Vacant Space
- Water
- Other Roads/Unknown
- Ronald Reagan Washingon National Airport

Note: Day care and library data for Prince George's County unavailable.

Sources: Arlington County Department of Environmental Services (land use); City of Alexandria Department of Planning & Zoning, 2008 (land use); Maryland Department of Planning (land use), 2002; District of Columbia Office of Planning (land use), 2002; Virginia Economic Developement Partnership GIS (point data), 2007.

Prepared by: Ricondo & Associates, Inc., 2008.

Exhibit I-7

0 4,500ft.

north

Generalized Existing Land Use in Airport Environs

THIS PAGE LEFT INTENTIONALLY BLANK

Table I-2

Demographic and Socioeconomic Data by Jurisdiction

	Arlington County	City of Alexandria	Prince George's County	District of Columbia
Demographic Data [a/]				
Total Residents (2006 estimate)	199,776	136,974	841,315	581,530
Percent Change (2000-2006)	+5.5%	+6.8%	+5.1%	+1.7%
Percent by Ethnicity Group, 2006[b/]				
Caucasian	80.2%	71.0%	27.9%	38.4%
African-American	8.7%	21.7%	66.0%	56.5%
Asian/Pacific Islander/Native Hawaiian	8.9%	5.4%	4.0%	3.3%
American Indian/Alaska Native	0.5%	0.4%	0.4%	0.4%
Reporting Two or More Races	1.6%	1.5%	1.7%	1.4%
Socioeconomic Data [a/]				
Median Household Income, 2004	$66,626	$60,715	$55,129	$46,211
Persons below Poverty Level, 2004	7.1%	8.3%	9.3%	18.3%

Note:
a/ The U.S. Department of Commerce, Bureau of the Census updates demographic and socioeconomic characteristics periodically for states and counties.
b/ Note: Columns may not add to 100 percent because of rounding.

Sources: U.S. Department of Commerce, Bureau of the Census: *State and County Quickfacts*. Last revised July 25, 2008, http://quickfacts.census.gov/qfd (website accessed November 17, 2008).
Prepared by: Ricondo & Associates, Inc., November 2008.

1.4.3.5 Historic, Archaeological, Architectural, and Cultural Resources (*see Section 4.3.5*)

Within the Airport boundary are cultural resources dating to the early colonial period and historic transportation resources associated with the development of the nation's capital. Archaeological and architectural resources on the Airport are shown on **Exhibit I-8**. Most of the Airport is located on fill, including the entire airfield, and, therefore, has low potential to contain additional intact archaeological resources. Past dredging operations removed sand and gravel from the bottom of the Potomac River to create the fill on which the Airport is located and would likely have destroyed any sites that may have existed in these borrow areas on the river bottom.

1.4.3.6 Aircraft Noise (*see Section 4.3.6 and Appendix D*)

The modeling assumptions and data related to aircraft operations, fleet mix, average daily number of operations by time of day, flight track use, operational profiles, and runway use are provided in Section 4.3.6 and Appendix D. Noise exposure contours associated with aircraft operations on an average day in 2007 are shown on **Exhibit I-9**.

THIS PAGE LEFT INTENTIONALLY BLANK

Sources: US Department of Agriculture, 2005 (Aerial photo); File, 2006,
Virginia Department of Historic Resources Archive (archaeological and architectural resources).
Prepared by: Straughan Environmental Services, Inc., November 2008.

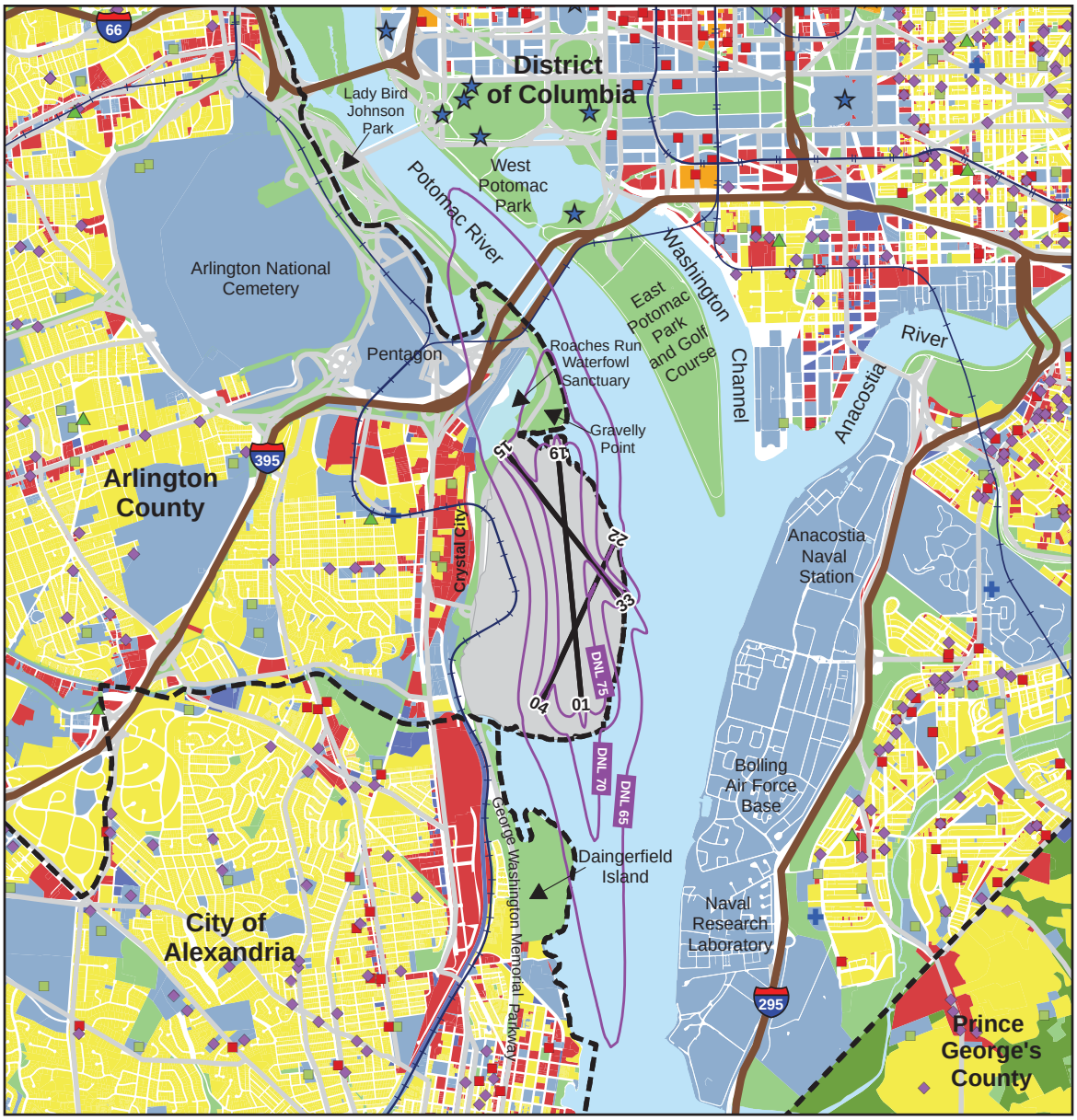
Exhibit I-8

0 2,000 ft.

north

Archaeological and Architectural Resources

THIS PAGE LEFT INTENTIONALLY BLANK



LEGEND

- Hospital
- School
- Day Care
- Library
- Religious Facility
- Landmark
- Interstate Highway
- Jurisdictional Boundary
- Major Road
- Railroad
- Runways
- 2007 Existing Noise Contours
- Residential
- Commercial
- Mixed Use
- Institutional/ Government
- Parks/Recreation
- Open Space
- Industrial
- Vacant Space
- Water
- Other Roads/Unknown
- Ronald Reagan Washingon National Airport

Sources: Arlington County Department of Environmental Services (land use); City of Alexandria Department of Planning & Zoning, 2008 (land use); Maryland Department of Planning (land use), 2002; District of Columbia Office of Planning (land use), 2002; Virginia Economic Developement Partnership GIS (point data), 2007; Ricondo & Associates, Inc., INM Version 7.0.a; INM Contour Layer: 07ext Noise-Contours, September 2008 (noise contours).

Prepared by: Ricondo & Associates, Inc., 2008.

Exhibit I-9

0 4,500ft.

north

2007 (Existing Conditions) Aircraft Noise Exposure Map

THIS PAGE LEFT INTENTIONALLY BLANK

In 2007, 1,452 acres in the Airport environs were exposed to aircraft noise of day-night average sound level (DNL) 65 and higher (expressed in A-weighted decibels). Please refer to Table IV-3 in Section IV. Just over 80 percent of the area exposed to DNL 65 and higher consists of Airport property or bodies of water. The next highest predominant land uses exposed to aircraft noise of DNL 65 and higher are parks (Daingerfield Island, Lady Bird Johnson Park, and Gravelly Point) or commercial land uses. (Please refer to Table IV-4 in Section IV.)

No people, dwelling units, religious facilities, convalescent homes, libraries, day care centers, schools, or hospitals were exposed to aircraft noise of DNL 65 and higher in 2007 (see Table IV-5 in Section IV). The eastern portion of Daingerfield Island (southwest of the Airport) is exposed to aircraft noise between DNL 65 and DNL 70. Gravelly Point is located just north of the Airport and is exposed to noise between DNL 70 and DNL 75. Northwest of Gravelly Point is Lady Bird Johnson Park, which is exposed to aircraft noise between DNL 65 and DNL 70.

1.4.3.7 Light Emissions and Visual Impacts (*see Section 4.3.7*)

Runway 1 is equipped with a high intensity approach lighting system with sequenced flashing lights, referred to as an ALSF-2 system. The ALSF-2 system is 2,400 feet long and consists of series of lights located at 100-foot intervals from the runway threshold. The ALSF-2 lights are oriented down the center of the Potomac River and skyward. Areas and facilities potentially sensitive to emissions from the Runway 1 approach lights at the Airport include the GWMP, Daingerfield Island (including the Indigo Landing Restaurant and the Washington Sailing Marina on the north side of the Island), the portion of the Mount Vernon Trail parallel to and west and south of the approach lights, and the Monumental Core of the nation's capital (East Potomac Park, West Potomac Park, Jefferson Memorial, and Franklin Delano Roosevelt Memorial Park). These areas and facilities are located in an urban, high ambient light environment. Indigo Landing Restaurant is the closest facility to the Runway 1 approach lighting system, located approximately 1,930 feet from the nearest light.

1.4.3.8 Solid Waste (*see Section 4.3.8*)

Solid waste managed by the Authority is collected and removed from the Airport by an offsite contractor (Metro Waste) and disposed of at approved regional facilities. Arlington County does not own or operate a landfill for municipal solid waste. There are also no landfills or major transfer stations located in Arlington County. The nearest landfill is the Interstate 95 (I-95) Sanitary Landfill in Lorton, Virginia, which is more than 18 miles from the Airport.

1.4.4 Physical Environment

1.4.4.1 Water Resources (*see Sections 4.4.1 and 4.5.3*)

The Airport lies within the Potomac-Shenandoah River Basin, the Middle Potomac River Sub-basin, and the Potomac River Watershed. The Airport was constructed, in part, by placing fill in areas of the Potomac River between Roaches Run and Four Mile Run. The Airport is surrounded by water on three sides: Roaches Run to the north (including a 53-acre lake at Roaches Run Waterfowl Sanctuary), the Potomac River to the east, and Four Mile Run to the south. One jurisdictional Water of the United States (a concrete-lined tidal channel) exists on the Airport, flowing under the existing pavement prior to the threshold of Runway 15 before emptying into Roaches Run.

No public groundwater supply wells are located on the Airport.

Surface Water Resources

While the portion of the Potomac River adjacent to the Airport is not listed as Wild and Scenic, it is listed as an American Heritage River. American Heritage Rivers represent the natural, historical, cultural, social, and economic diversity of American waterways. The Virginia section of the Potomac River (located approximately 2.8 miles south/downstream of the Airport) and Four Mile Run are designated by the Commonwealth of Virginia as Class II (freshwater-tidal) waterways. Five use categories are designated for the District of Columbia section of the Potomac River, including primary contact; secondary contact and aesthetic enjoyment; wildlife, fish, and shellfish protection and propagation; protection of human health related to fish and shellfish consumption; and navigation. Roaches Run to the north of the Airport is not anticipated to be affected by the Proposed Action. Water quality findings for the Potomac River and Four Mile Run are summarized below.

- Potomac River Water Quality – The District of Columbia's 2008 report on water quality[3] indicates that, of the five designated use categories, the section of the Potomac River within the District fully supports the uses of *secondary contact* recreation and aesthetic enjoyment and *navigation*. The section of the river from Haines Point to the Woodrow Wilson Bridge (the section nearest the Airport) also supports the use of *protection and propagation* of fish, shellfish, and wildlife. No portion of the Potomac River within the District supports the uses of *primary contact* (e.g., swimming) or *protection of human health related to consumption of fish and shellfish*. The reason for nonattainment of the water quality standards for the applicable use includes high fecal coliform levels and a 1994 D.C. Commissioner of Public Health advisory that urges nonconsumption of fish caught within District waters. The Virginia Department of Environmental Quality (VDEQ) does not designate the Potomac River as a nutrient-enriched waterway of concern. The section of the Potomac River in Arlington is well below the maximum standard for concentration of total ammonia-nitrogen in fresh water.
- Four Mile Run Water Quality – The 20-square-mile Four Mile Run watershed is one of the most urbanized drainage basins in Virginia. After seven major floods in the 1960s and 1970s, the U.S. Army Corps of Engineers (ACE) channelized the 2.3 miles of the Run farthest downstream to manage stormwater runoff and flooding. Four Mile Run is on the 303(d) list of streams violating water quality standards for multiple pollutants, including excessive fecal coliform and *e. coli* bacteria levels and excessive polychlorinated biphenyls (PCBs), and is macrophyte-impaired (a macroscopic aquatic plant) due to excessive nutrients. Four Mile Run has been targeted as a "high priority watershed" for controlling non-point-source pollution by the Commonwealth of Virginia. It is currently in compliance with the numerical criteria for Class II waterways in Virginia. A Total Maximum Daily Load (TMDL) Implementation Plan was completed for the nontidal portion of Four Mile Run in 2002. Although Four Mile Run is not located within the limits of physical disturbance, runoff from the Proposed Action during construction would need to be managed to avoid impacts to Four Mile Run.

Groundwater Resources

The regional groundwater table is located approximately 15 feet below the surface, except in areas where building foundations or tunnels exist, where groundwater may be as much as 25 feet below the

[3] District of Columbia, Department of the Environment, *The District of Columbia Water Quality Assessment, 2008 Integrated Report to the Environmental Protection Agency and the U.S. Congress Pursuant to Sections 305(b) and 303(d) Clean Water Act*, September 2008.

surface. The groundwater table fluctuates seasonally by 3 to 5 feet. The closest groundwater recharge area to the Airport is in the Arlington National Cemetery area.

River Bottom Resources and Sediment Quality

In 2006/2007, a sediment quality study[4] was conducted in the Potomac River in support of the Authority's Phase III Study, a preliminary RSA planning study (see Section 3.2.3). Although the area directly south of Runway 1 within the LOPD was not sampled, similar findings can be expected there because of its relatively close proximity to the Runway 33 sampling area. The investigations indicated that surface water depths vary from 10.5 to 16.5 feet.[5] Collected sediment samples indicate that the local river sediments are predominantly fine sand and silt (with high organic content) between 0 and 15 feet deep. Boreholes for these investigations were driven until refusal, which varied from elevation -35 to -93 feet. Water and mud extended to a depth of -35 feet surface elevation near the Runway 22 end and to a depth of -49 feet surface elevation at the Runway 33 end. Beneath the mud, relatively firm subsurface material consisting of sand and gravel with some silt and clay was found in all borehole locations. Varying concentrations of metals, pesticides, semivolatile organic compounds, arsenic, tributyl tin, dioxins, and petroleum hydrocarbons were detected in the sediment samples. Please refer to **Appendix G** for the results of the chemical analysis on these sediment samples.

1.4.4.2 Floodplains (*see Section 4.4.2*)

Roughly 200 acres of the Airport site are located within the 100-year floodplain (see **Exhibit I-10**). In a 1991 watershed analysis for an earlier project at the Airport,[6] the 100-year base flood elevation for the Potomac River was found to be 11.4 feet above mean sea level (MSL), with approximately 3 feet of tidal range.

1.4.4.3 Air Quality (*see Section 4.4.3 and Appendix F*)

Air Quality Standards and Attainment Status

The Virginia Air Quality Control Board has adopted ambient air quality standards that are identical to the federal standards. The Airport is located in the Metropolitan Washington region. The Airport and adjacent areas are all within Arlington County in the Commonwealth of Virginia. The areas north and east of the Airport and across the Potomac River are within the District of Columbia. Arlington County, Virginia, has been designated by the U.S. EPA as being in nonattainment of the 8-hour ozone and fine particulates ($PM_{2.5}$) National Ambient Air Quality Standards (NAAQS). The U.S. EPA designated the region as a moderate nonattainment area for the 8-hour ozone standard in April 2004.[7] The region was designated a nonattainment area for the 1997 $PM_{2.5}$ standard in January 2005; however, on October 22, 2008, the U.S. EPA changed the classification to attainment/maintenance.[8] Arlington County is designated as a moderate attainment/maintenance area for carbon monoxide (CO) and as an attainment area for all other criteria pollutants.

4 Straughan Environmental Services, Inc., *River Sediment Quality Assessment Report Runway 15/33 and 4/22 Safety Area Study*, July 2007.

5 Thomas L. Brown Associates, P.C. *Geotechnical Study, Runways 4-22 & 15-33 RSA, Constructability Assessment, Ronald Reagan Washington National Airport*, November 2006.

6 Lowe Engineers, *Watershed Analysis of the Washington, D.C., National Airport*, 1991.

7 69 Federal Register 84, April 30, 2004.

8 70 Federal Register 3, January 5, 2005.

THIS PAGE LEFT INTENTIONALLY BLANK

Note: Terminal construction in 1997 affected floodplain limits near buildings

Sources: US Department of Agriculture, 2005 (aerial photo); EA Engineering, 2006, based on 100-Year Floodplain elevation of 11.4 feet from Federal Emergency Management Agency, 1985 (Floodplain).
Prepared by: Straughan Environmental Services, Inc., November 2008.

Exhibit I-10

Not to Scale

north

100-Year Floodplain

THIS PAGE LEFT INTENTIONALLY BLANK

State Implementation Plans

The Metropolitan Washington Air Quality Committee (MWAQC) is the entity that prepares air quality plans (i.e., State Implementation Plans [SIPs]) for the Metropolitan Washington region, which includes Washington, D.C., and areas of southern Maryland and northern Virginia. Each state and the District of Columbia then submit the same SIP under separate state covers for approval.

MWAQC prepared an 8-hour ozone SIP for the Metropolitan Washington region in May 2007 and a $PM_{2.5}$ SIP for the region in March 2008. The ozone SIP and the $PM_{2.5}$ SIP were then submitted to the U.S. EPA by each state and the District of Columbia. The U.S. EPA designated the region as moderate nonattainment for the 8-hour ozone standard in April 2004, with a deadline of June 15, 2010, to meet the standard. The region is to attain the $PM_{2.5}$ standard no later than April 2010. The MWAQC also prepared a maintenance plan for CO, which was approved by the U.S. EPA on March 16, 1996. As part of the maintenance demonstration for CO, the MWAQC must demonstrate that emissions would not exceed the levels presented in the attainment inventory through 2016.

Ambient Air Quality Monitoring

Air quality monitoring data collected at three Arlington County monitoring sites in 2007 show that the reported averaging periods are consistent with the NAAQS. (The reported averages are presented in Table IV-10 and the air quality monitoring sites are shown on Exhibit IV-8 in Section IV). A maximum concentration of 44.5 $\mu g/m^3$ of $PM_{2.5}$ was recorded at the monitoring station 1.2 linear miles west of the Airport; the 24-hour NAAQS is 35 $\mu g/m^3$. No exceedances of the other NAAQS were recorded in 2007 at the three monitoring sites.

1.4.4.4 Hazardous Materials (*see Section 4.4.4*)

The entire Airport area south of Levee Road and east of the Ogden Equipment Building (see Exhibit I-8; the Ogden Equipment Building, formerly the Jet Engine Test Cell, is identified as cultural resource "C") is referred to as the South Investigation Site (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" (NFRAP) from the U.S. EPA. In a meeting held on June 26, 2007, representatives from U.S. EPA Region 3 indicated that additional investigation was required before the SIS could be considered for NFRAP status. The resolution of the SIS may not occur prior to the initiation of construction of the Proposed Action. If so, all excavated materials from within the SIS would be disposed of off-Airport, and will be tested before disposal. Any material found to be hazardous waste will be disposed of in accordance with federal and state requirements. In-water construction will be conducted in accordance with permit conditions.

1.4.4.5 Natural Resources and Energy Supply (*see Section 4.4.5*)

The Airport does not use scarce or rare resources. There are sufficient energy supplies and other utilities to operate the Airport.

1.4.5 Biological and Natural Environment

1.4.5.1 Fish, Wildlife, and Plants (*see Section 4.5.1 and Appendix E*)

Aquatic Habitat

Aquatic habitats associated with the Potomac River, Four Mile Run, and Roaches Run that are capable of supporting populations of fish include unvegetated subtidal bottoms, intertidal flats,

submerged aquatic vegetation (SAV), emergent marshes, and deepwater habitats. The Potomac River is used by species exhibiting unique life cycles that inhabit fresh, salt, and/or estuarine waters. (Please refer to Table E-1 in Appendix E.) The Potomac River provides a migratory pathway for these fish and spawning grounds for some migratory species. No Essential Fish Habitats are located within the vicinity of the Airport.

The Airport is located in the upper tidal watershed of the Potomac River. The Potomac River and Four Mile Run provide habitat for benthic macroinvertebrates, which serve an important role in the aquatic food chain and also serve as indicators of water quality. Macroinvertebrate data collected in 2001[9] were assigned a biological integrity ranking of "fair" based on an index of good, fair, and poor. The in-stream habitat was assigned an optimal rating on a scale of marginal, suboptimal, and optimal. Data collected in 2005 from the lower mainstem of Four Mile Run[10] indicate that water quality is less than ideal yet not degraded to the point that pollution-sensitive species have been suppressed. (Please refer to Tables E-2 and E-3 in Appendix E.)

The Virginia Institute of Marine Science has documented SAV in the vicinity of the Airport. Both the distribution and density of SAV fluctuate due to varying turbidity levels of the water of the Potomac River as precipitation levels vary from year to year. (Please refer to Table E-4 in Appendix E.)

Terrestrial Habitat

Terrestrial habitats on and adjacent to Airport property include forest, turf, and paved areas. Aerial photography indicates a relatively large forest stand in the vicinity of Roaches Run Waterfowl Sanctuary, including a narrow portion along the GWMP. Mammal, reptile, and amphibian species observed in the vicinity of Roaches Run Waterfowl Sanctuary and the GWMP are summarized in Table E-5 in Appendix E.

Avian Habitat

Because of the variety of aquatic and terrestrial habitats surrounding the Airport, several classes of resident and migratory birds, including waders (herons and egrets), shorebirds (sandpipers and plovers), aerial-searching birds (gulls and terns), waterfowl (ducks, geese, and swans), and birds of prey (hawks and owls), may be found in the vicinity. Bird species observed at the Airport, Roaches Run Waterfowl Sanctuary, the mouth of Four Mile Run, and Daingerfield Island are listed in Table E-6 in Appendix E.

1.4.5.2 Threatened and Endangered Species (*see Section 4.5.2*)

Based on a July 18, 2006, letter from the U.S. Department of the Interior, Fish and Wildlife Service (FWS), "except for occasional transient individuals, no proposed or federally-listed endangered or threatened species are known to exist within the project impact area." (Please refer to **Appendix B** for a copy of this letter). Additional correspondence with the U.S. FWS indicated that the federally

[9] Maryland Department of Natural Resources, *Data Summary for: Upper Tidal Potomac River (Metropolitan Washington Basin)* PRUT-116-R-2001, PRUT-116-R-2001, and *Maryland Biological Stream Survey*, http://mddnr.chesapeakebay.net/mbss/SA_site2k.cfm?siteyr=PRUT-116-R-2001, 2001 (website accessed July 23, 2008).

[10] Arlington County Department of Environmental Services, *Volunteer Stream Monitoring Program 2005 Data Report*, http://www.arlingtonva.us/Departments/EnvironmentalServices/epo/pdffiles/streammon_05.pdf (accessed July 23, 2008).

endangered shortnose sturgeon (*Acipenser brevirostrum*) does use the Potomac River to travel to and from spawning grounds north of the Airport from overwintering habitat downriver of the Airport.

The Virginia Department of Conservation and Recreation (VDCR) maintains a statewide inventory of Natural Heritage Resources and their status under the Virginia Natural Heritage Program (VANHP). One state-protected species, the wood turtle (*Glyptemys insculpta*), has been identified in Arlington County under the VANHP. It is listed as a state-threatened species but has no federal status. Virginia's list of threatened species, endangered species, and species of concern within a 3-mile radius of the Airport is included in Table E-7 in Appendix E.

The bald eagle and upland sandpiper have been observed at the Airport, engaging in behaviors such as flying, feeding, and loafing. Bald eagle observations have been recorded yearly between 1997 and 2006. During the same time period, upland sandpipers were observed between 1997 and 1999, and in 2001.

1.4.5.3 Wetlands and Waterways (*see Section 4.5.3*)

Jurisdictional Waters of the United States exist on and adjacent to the Airport: the Potomac River to the south of the Airport along a portion of the approach light pier, as well as Four Mile Run and Roaches Run. These waters also include delineated wetlands, waterways, and special aquatic sites. In accordance with the U.S. Army Corps of Engineers' *Wetlands Delineation Manual*, wetlands and Waters of the United States on and near the Airport were identified through a combination of document research and field investigation. Resources identified within the study area surrounding the RSAs for Runway 4-22 and Runway 15-33 were confirmed by a U.S. ACE jurisdictional determination in January 2008, and extension of this determination to the areas surrounding the area for construction of the Proposed Action was confirmed by a U.S. ACE jurisdictional determination in October 2008. No wetlands regulated by the U.S. ACE, VDEQ, or Virginia Marine Resources Commission (VMRC) are located on Airport land within the LOPD. The Potomac River is classified as a navigable, tidally influenced Water of the United States.

1.4.5.4 Coastal Resources (*see Section 4.5.4*)

As a result of the Airport's location relative to the political boundary between the Commonwealth of Virginia and the District of Columbia (i.e., the high tide mark of the Potomac River), many of the coastal resources in the vicinity of the Airport are managed by various federal, District, and Commonwealth agencies. While many of the coastal resources fall outside the jurisdiction of the Virginial Coastal Resources Management Program (VCP), the VCP is used as a logical means of evaluating those resources. The enforceable policies of the VCP and associated policies that apply to the resources within the study area are identified below:

- **Fisheries Management**: Potomac River, Four Mile Run, and Roaches Run provide fish habitat within the vicinity of the Airport.
- **Subaqueous Lands Management**: Potomac River bottom and shore are located within the LOPD.
- **Wetlands Management**: Tidal and nontidal wetlands associated with the Potomac River.
- **Non-Point-Source Water Pollution Control**: Soil-disturbing projects must be designed and constructed in a manner to reduce soil erosion and to decrease potential inputs of chemical nutrients and sediments to the Chesapeake Bay.

- **Point Source Water Pollution Control**: Discharges into state waters are managed in accordance with the Airport's National Pollutant Discharge Elimination System (NPDES) permit.
- **Coastal Lands Management**: includes state waters and a 100-foot buffer adjacent to and landward of these features.

Three enforceable policies of the VCP (i.e., dunes management, shoreline sanitation, air pollution control) either do not relate to resources within the study area or are not applicable to the Proposed Action under consideration.

According to the Federal Emergency Management Agency's (FEMA's) "Coastal Barrier Resource System," there are no coastal barrier resources near the Airport or within the adjacent counties or cities.

1.5 Environmental Consequences of the Proposed Action

Detailed information on the environmental consequences of the Proposed Action is presented in Section V. Relevant subsections of Section V are noted below in parentheses. The findings in Section V support a conclusion that the Proposed Action would not cause a significant individual or cumulative impact on the environmental impact categories identified in FAA Order 1050.1E, Appendix A, "Analysis of Environmental Impact Categories," for the reasons summarized below.

- **Aircraft Noise** (*see Section 5.2*): No new or existing noise-sensitive areas would be exposed to aircraft noise of DNL 65 and higher under the Proposed Action. No existing noise-sensitive areas would be exposed to a change of DNL 1.5 or more compared with the No Action alternative.
- **Compatible Land Use** (*see Sections 5.2 and 5.3*): There would be no significant increases in aircraft noise over noise-sensitive areas. The nearest landfill is 18 miles from the Airport and would not pose any wildlife attractant concerns.
- **Air Quality** (*see Section 5.4*): The Proposed Action would: have no effect on the number or type of aircraft using the Airport or runway use; would have a negligible effect on average aircraft taxiing times; and would not cause or contribute to an exceedance of the NAAQS. A general conformity determination is not required for the Proposed Action.
- **Water Quality** (*see Section 5.5*): The Proposed Action would be designed and constructed to reduce soil erosion and control potential inputs of chemical nutrients and sediments to the adjacent receiving waters, namely, the Potomac River and Four Mile Run. The Authority would comply with applicable permits and water quality certifications. The Proposed Action is not in the proximity of a groundwater recharge area.
- **Wetlands and Waterways of the United States** (*see Section 5.6*): No wetlands regulated by the U.S. ACE, VDEQ, or VMRC are located within the LOPD; therefore, no fill or alteration of wetlands would occur. The Proposed Action would not require dredging and generally would not place fill into the Potomac River. During detailed future design of the Proposed Action, should caissons be used instead of pilings, the Authority would apply for a Section 404 permit and would abide by the terms of the permit and accompanying water quality certifications. Significant impacts are not expected.

- **Floodplains** (*see Section 5.7*): Portions of the Proposed Action and associated LOPD are within the 100-year floodplain of the Potomac River, along with other existing airport facilities that are fixed by function; however, it would not significantly impede the 100-year flood elevation or present any barriers to flood flow passage. Due to the large storage capacity of this unconstrained tidal floodplain and the +/- 3-foot tidal range of the Potomac River, the Proposed Action would have negligible, if not indiscernible, impacts to the lateral extent, depth, or duration of flooding, and would not increase flood risk at the Airport or on adjacent properties upstream or downstream of the Airport.
- **Coastal Resources** (*see Section 5.8*): The Proposed Action is not located on a coastal barrier. Pending a VCP consistency determination from the VDEQ, it is reasonable to believe that there would be no impacts to coastal resources because: (a) the Proposed Action would be designed and constructed in accordance with local, state, and federal guidelines; (b) the Authority would minimize and mitigate unavoidable impacts, if any; and (c) the Authority would secure, comply with, and update the applicable stormwater permits and pollution prevention plans.
- **Fish, Wildlife, and Plants** (*see Section 5.9*): The Proposed Action would not impact rare, threatened, or endangered species; species of concern; or species of greatest conservation need. The Proposed Action would not involve the taking or relocation of specimens and/or cause the loss of critical terrestrial or aquatic habitat. Installation of additional pilings for relocation of the approach lighting facilities has the potential to temporarily increase turbidity. Mitigation measures would be developed during final design in accordance with any required permit conditions and/or District of Columbia water quality certification requirements. The location of SAV in the vicinity of the Airport fluctuates from year to year. If SAV is present in the area where the approach lights are relocated at the time of construction, the Authority would coordinate closely with the U.S. ACE, National Marine Fisheries Service (NMFS), and VDCR, as required.
- **Light Emissions and Visual Impacts** (*see Section 5.10*): The closest (southernmost) relocated approach light would be 1,812 feet from the Indigo Landing Restaurant (adjacent to the Washington Sailing Marina), 120 feet closer than the current southernmost approach light. Given that these lights are not oriented toward Daingerfield Island (including the restaurant and marina), the GWMP, or the Mount Vernon Trail, but rather in a skyward direction to the south and along the Potomac River, the relocated approach lights are not likely to cause a notable change in light emissions. The additional pilings would be placed in the Potomac River adjacent to the existing approach light pier and the relocated approach lights would be located along the existing pier, thereby avoiding any detraction from the existing viewsheds.
- **Department of Transportation Act, Section 4(f) and Section 6(f) Lands** (*see Section 5.11*): No public lands bordering the Airport qualify as Section 6(f) lands. The Proposed Action does not involve a physical or constructive use of Section 4(f) lands.
- **Historic, Archaeological, Architectural, and Historic Resources** (*see Section 5.12*): These resources are located well beyond the LOPD. The airfield was constructed predominantly on a heavily developed, manmade peninsula; there is very little potential for any yet unknown resources to be affected. The D.C. State Historic Preservation Office concluded that the Proposed Action would have no adverse effect on historic properties. The Virginia Department of Historic Resources (VDHR) and the Authority have agreed to use the NEPA process to conduct the required Section 106 of the National Historic Preservation Act

of 1966 consultation; comments received from the VDHR will be included in the Final EA. The 300-foot runway extension and relocation of the approach light bars are consistent with the development and land use of the Airport and would have no adverse visual effect on any nearby resources, including the GWMP (please refer to Section 5.10).

- **Natural Resources and Energy Supply** (see Section 5.13): The Proposed Action would result in a very small increase in electricity demand associated with the runway edge lights and taxiway edge lights that would be added when Runway 1 and Taxiway J are extended by 300 feet. The Proposed Action would have no impact on the consumption of other utilities, such as natural gas, water, and sewage. The Proposed Action does not involve unusual, fuel-consuming construction or operational circumstances, or the consumption of scarce or unusual materials. The relocated Runway 1 threshold would result in slightly longer taxiing times for aircraft departing on Runway 1. However, the expansion of the Runway 1 Hold Apron, which would allow the largest aircraft operating at the Airport to bypass the hold apron, is expected to reduce the time aircraft are queued on the taxiway waiting to take off. The Proposed Action would not increase the number of on-Airport service vehicles or substantially alter the time needed for the existing service fleet to arrive at gates when needed.
- **Hazardous Materials, Pollution Prevention, and Solid Waste** (*see Section 5.14*): Consistent with the requirements of FAA AC 150/5370-10C, *Standards for Specifying Construction of Airports*, the construction contractor would take the necessary precautions to prevent pollution relating to fuels, oils, bitumens, chemicals, or other harmful materials and to prevent pollution of the atmosphere from particulate and gaseous matter. The pollution prevention plan for the Proposed Action would require the contractor to manage other wastes on site, such as building materials, garbage, and debris; to have controls in place to minimize the exposure of these materials to storm water; and to minimize the discharge of pollutants. It is possible that the resolution of the South Investigation Site may not occur by the time that the Authority needs to start construction of the Runway 1-19 RSA enhancements and the rest of the Proposed Action. If so, all materials excavated from within the SIS would be disposed of off-Airport, and will be tested before disposal. Any material found to be hazardous waste will be disposed of in accordance with federal and state requirements. In-water construction will be conducted in accordance with permit conditions.
- **Construction Impacts** (*see Section 5.15*): Construction impacts are discussed by resource category below:
  - Air Quality: In terms of air quality, the net change in direct and indirect emissions would be below *de minimis* thresholds and would not be regionally significant. Implementation of the Proposed Action would not cause or contribute to an exceedance of the NAAQS.
  - Water Quality: Potential water quality impacts resulting from soil erosion, storm water runoff, increased suspended sediment in the water column, resuspension and redeposition of sediments, dissolved constituent release, or disturbance of Potomac River bottom sediments would be minimized by using control measures, including those in the latest version of the *Virginia Erosion and Sediment Control Handbook*, an approved erosion and sediment control plan, and FAA AC 150/5370-10C. All necessary erosion and sediment control measures would be implemented prior to beginning each element of construction. With the closest groundwater recharge area located west of I-395, near Arlington National Cemetery, construction of the Proposed Action would have no adverse effect on groundwater resources.

- Fish, Wildlife, and Plants: Construction activities would present only a temporary disruption of any wildlife activities. If any SAV were to be present within the LOPD associated with the approach light relocation, construction activities could result in localized plant damage. Because SAV locations and densities fluctuate widely year-to-year, it is impossible to predict at this time whether any construction-related impacts would occur in this category. However, if they did occur, they would be localized to the near-shore section of the existing pier. The design of the relocated approach light structures would minimize any potential effects of shading of waters beneath the pier, including SAV that may grow there; therefore, the site would still be capable of supporting future SAV growth.
- Hazardous Materials: It is possible that the resolution of the South Investigation Site may not occur by the time that the Authority needs to start construction of the Runway 1-19 RSA enhancements and the rest of the Proposed Action. If so, all materials excavated from within the SIS would be disposed of off-Airport, and will be tested before disposal. Any material found to be hazardous waste will be disposed of in accordance with federal and state requirements. In-water construction will be conducted in accordance with permit conditions. The potential for increased water pollution from contaminated soils would be controlled through storm water system design; compliance with federal, state, and local requirements; and the application of engineering control measures, as discussed in the water quality paragraph above and best management practices included in Section VI. Arsenic, lead, and low levels of other contaminants exist on the Potomac River bottom. Any dredging or pile driving activities in the Potomac River near the Airport would have the potential to release pollutants that may be trapped in the sediment for transport downstream. At this time, the Proposed Action is not anticipated to require any dredging. Mitigation measures would be developed during final design in accordance with any required permit conditions and/or District of Columbia water quality certification requirements.
- Construction Noise: Increased noise from construction vehicles is expected as a result of the Proposed Action. Distance would rapidly attenuate noise levels and there is an absence of noise-sensitive land uses within the vicinity of the Proposed Action. The noise impacts would be temporary and insignificant.

- **Socioeconomic Impacts, Environmental Justice, and Children's Health and Safety Risks** (*see Section 5.16*): The Proposed Action would not create significant aircraft noise impacts in noise-sensitive areas, involve relocation of residences or businesses, disrupt established or planned communities or local traffic patterns, or result in disproportionate impacts on low income or minority populations or risks to children's health and safety.
- **Secondary (Induced) Impacts** (*see Section 5.17*): The Proposed Action would not result in shifts in patterns of population movement or growth, increases in public service demands, or changes in business and economic activities. The Proposed Action would not increase aircraft activity, change runway use, or contribute to an increase in aircraft activity.
- **Cumulative Impacts** (*see Section 5.18*): The cumulative impacts analysis focused only on construction-related impacts because the Proposed Action would not affect the environmental categories listed in FAA Order 1050.1E, Appendix A, "Analysis of Environmental Impact Categories," except during the construction period. Actions with construction periods within the timeframe of construction related to the Proposed Action include the overlay Runway 15-33, the overlay and partial depth rehabilitation of taxiways associated with

Runway 15-33, and the construction of additional levels to Parking Garages A and B/C. In each case, the construction-related cumulative impacts were determined to be temporary and insignificant.

1.6 Environmental Impacts of the No Action Alternative

None of the improvements included in the Proposed Action would be constructed under the No Action alternative. There would be no difference in the impacts associated with aircraft noise and compatible land use between the Proposed Action and the No Action alternative. The Authority submitted a Categorical Exclusion on December 3, 2008, under FAA Order 1050.1E, paragraph 310e, for the resurfacing of Runway 15-33 and the resurfacing/rehabilitation of the taxiways associated with Runway 15-33. The Authority submitted a Form A Categorical Exclusion covering the addition of levels to Parking Garages A and B/C to the FAA on July 17, 2006. The FAA found that both projects would qualify as Categorical Exclusions.[11]

1.7 Mitigation

The analysis presented in Section V forms the basis for concluding that the Proposed Action is not expected to cause a significant impact, by itself or cumulatively, in any of the environmental impact categories listed in FAA Order 1050.1E, Appendix A, "Analysis of Environmental Impact Categories." Therefore, mitigation measures would not be necessary to reduce potentially significant impacts below applicable significance thresholds. However, in constructing the Proposed Action, the Authority would employ the practices and adhere to the guidance set forth in FAA Advisory Circulars, applicable state and county handbooks and regulations, and Authority guidance and manuals identified in Section VI to avoid or reduce any potential adverse environmental impacts.

1.8 Agencies and People Consulted

Section VII of this EA provides a description of the consultation process used throughout the preparation of this EA. The Authority hosted a public scoping workshop and an agency scoping meeting on July 30 and July 31, 2008, respectively. The public Notice of the Workshop was advertised in *The Washington Post* on June 29 and June 30, 2008. Notice of the workshop was also posted on the Airport's web site (http://www.mwaa.com). The agencies were invited to the agency scoping meeting by letter dated June 27, 2008.

The following agencies and individuals provided input during the scoping process:

Federal Agencies

- Federal Aviation Administration
  - Maria Stanco, Eastern Region
  - Jennifer Mendelsohn, Washington Airports District Office
  - Terry Page, Manager, Washington Airports District Office
- National Oceanic and Atmospheric Administration
  - Julie Crocker
  - John Nichols, National Marine Fisheries Services
- U.S. Department of the Interior, Fish and Wildlife Service
  - Mary J. Ratnaswamy, Ph.D.

[11] Terry J. Page, Manager, Washington Airports District Office, Federal Aviation Administration, letter to William C. Lebegern, P.E., Manager, Planning Department, Metropolitan Washington Airports Authority, July 24, 2006.

  - Robert Zepp

- U.S. Department of the Interior, National Park Service
  - Sally Blumenthal
  - Deborah Feldman
  - Jon G. James
  - Sean McCabe
  - Daniel McClarren
  - Brent O'Neill
  - Vincent Santucci
  - Brent Steury
  - David Vella
  - Matthew Virta

- U.S. Army Corps of Engineers
  - Theresita M. Crockett-Augustine
  - Jack Dinne
  - Paul Wettlaufer

State Agencies

- Virginia Department of Environmental Quality
  - Ellie Irons

- Virginia Department of Conservation and Recreation, Division of Natural Heritage
  - Michelle E. Edwards
  - Kristaal McKelvey

- Virginia Department of Conservation and Recreation, Dam Safety, Floodplain Management
  - David Gunn, P.E.

- Virginia Department of Game and Inland Fisheries
  - Amy Ewing
  - Amy Martin
  - Jaime L. Sajecki

- Virginia Department of Historic Resources
  - Marc Holma

Local Agencies

- District of Columbia
  - Adrian Fenty, Mayor
- D.C. Department of the Environment
  - Fisheries and Wildlife, Bryan King
  - Water Quality, Collin Burrell
  - Water Quality, Adion Chinkuyu

- D.C. State Historic Preservation Office
  - C. Andrew Lewis

- City of Alexandria, Transportation and Environmental Services
  - Erica Bannerman
  - Lalit Sjarma

- Potomac River Fisheries Commission

- Kirby A. Carpenter

Other Parties Consulted

- Stephen Eckenrode, Resident, Palisade Gardens
- Jelani Gowdy, Resident
- Bernadette Lipari, Resident, Laurel, Maryland
- Karyl Owings, Member, Sailing Club of Washington
- Peter Pennington, Resident, Alexandria, Virginia

The Draft EA will be available for public comment pursuant to a public notice to be placed in *The Washington Post* and on the Authority's website.