2020 FOURTH FIVE-YEAR REVIEW

SITE 8B - SOUTHWEST CORNER LANDFILL
JOINT BASE ANACOSTIA-BOLLING
WASHINGTON, D.C.

Revision: 0

Prepared for:

Department of the Navy
Naval Facilities Engineering Command Washington
1314 Harwood Street SE
Washington Navy Yard, DC 20374-5051

November 2020

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Prepared by:

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1500 Wells Fargo Center
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Contract #: N62470-11-D-8013
Contract Task Order #: JU01 MOD 04
Project #: 60263681

November 2020

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LIST OF ACRONYMS AND ABBREVIATIONS

amsl	above mean sea level
AOCs	Areas of Concern
ARARs	Applicable or Relevant and Appropriate Requirements
BAFB	Bolling Air Force Base
bgs	below ground surface
BWSI	Base-Wide Site Investigation
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COPC	chemicals of potential concern
CTO	Contract Task Order
DD	Decision Document
DERP	Defense Environmental Restoration Program
DoD	Department of Defense
DOEE	District Department of Energy and Environment
ERP	Environmental Restoration Program
ICs	Institutional Controls
IRP	Installation Restoration Program
JADOC	Joint Air Defense Operations Center
JBAB	Joint Base Anacostia-Bolling
LTM	long-term monitoring
LUCAP	Land Use Control Assurance Plan
LUCIP	Land Use Control and Implementation Plan
M&E	Metcalf and Eddy
NAVFAC	Naval Facilities Engineering Command
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NFRAP	No Further Response Action Planned
NPL	National Priorities List
NRL	Naval Research Laboratory
NSFA	Naval Support Facility Anacostia
O&M	operation and maintenance
ORP	oxidation-reduction potential
OSWER	Office of Solid Waste and Emergency Response
OU	Operable Unit
PA	Preliminary Assessment
PAHs	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl

RAOs	remedial action objectives
RI	Remedial Investigation
RPM	Remedial Project Manager
SVOCs	semi-volatile organic compounds
SCL	Southwest Corner Landfill
SI	Site Inspection
TAL	Target Analyte List
TCL	Target Compound List
TPH-DRO	Total Petroleum Hydrocarbons – Diesel Range Organics
TPH-GRO	Total Petroleum Hydrocarbons – Gasoline Range Organics
TSD	Toxic Substances Division
USEPA	United States Environmental Protection Agency
UU/UE	unrestricted use/unrestricted exposure
UXO	unexploded ordnance
WQD	Water Quality Division
VOCs	volatile organic compounds

NAVY FIVE-YEAR REVIEW KEY REVIEW INFORMATION

SITE IDENTIFICATION		
Site name: Site 8B, Southwest Corner Landfill, Joint Base Anacostia-Bolling		
EPA ID: DC5570024443		
Region: 3	**State:** DC	**City/County:** Washington
SITE STATUS		
NPL status: Not on the National Priorities List (NPL)		
Remediation status: Complete (Long-Term Monitoring [LTM] and Institutional Controls [ICs])		
Multiple Operational Units (OUs)? No	**Number of Sites/OUs:** 1/Not Applicable	
Construction completion date: October 1998		
Fund/PRP/Federal Facility Lead: Federal Facility	**Lead Agency:** Department of the Navy, Naval Facilities Engineering Command (NAVFAC) Washington	
Has site been put into reuse? Yes		
REVIEW STATUS		
Who conducted the review (EPA Region, State Federal Agency): NAVFAC Washington		
Author name: David Collins	**Author title:** Remedial Project Manager	
Author affiliation: NAVFAC Washington		
Review period: June 2020 – November 2020		
Date(s) of site inspection: July 2020		
Highlight: Statutory		
Policy type: Ongoing		
Review number: 4		
Triggering action: Signing of Previous Five-Year Review Report		
Triggering action date: 30 November 2016		
Due date ***(four years since previous review date)*****:** 30 November 2020*		

* Due date was revised to return to the original five-year review schedule.

FIVE-YEAR REVIEW SUMMARY FORM

Issues:

None.

Recommendations and Follow-up Actions:

Continue to conduct LTM and routine operation and maintenance, and implement ICs outlined in the Land Use Control and Implementation Plan (LUCIP).

Protectiveness Statement:

The remedy completed for Site 8B remains protective of human health and the environment.

Other Comments:

None.

Next Review:

The next five-year review for Site 8B should be conducted within five years of the signature date of this report.

2020 FIVE-YEAR REVIEW REPORT SIGNATURE COVER

Site 8B/Southwest Corner Landfill
Joint Base Anacostia-Bolling, Washington, DC

November 2020

This report documents the 2020 Fourth Five-Year Review for Site 8B at Joint Base Anacostia Bolling based on the Record of Decision for taking action. This review was conducted as required by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) in accordance with CERCLA § 121(c), as amended, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), Part 300.430(f)(4)(ii) of the Code of Federal Regulations.

Approved by:

ZUHLSDORF.MICHAEL.J.1101504316

Digitally signed by ZUHLSDORF.MICHAEL.J.1101504316
Date: 2020.11.16 14:06:34 -05'00'

16 Nov 20

Colonel Michael Zuhlsdorf
Installation Commanding Officer
Joint Base Anacostia-Bolling

Date

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EXECUTIVE SUMMARY

This document presents the findings of the Fourth Five-Year Review Report for Navy Environmental Restoration Program (ERP) Site 8B - the Southwest Corner Landfill (SCL) located at Joint Base Anacostia-Bolling (JBAB), Washington, DC. The final remedy for the site consists of LTM combined with ICs to protect human health and the environment.

The LTM and ICs remedy for Site 8B is protective of human health and the environment. The remedy is functioning as intended. The current and expected future land use is consistent with the ICs established for the site. The exposure assumptions and toxicity data used at the time of the final remedy selection are still valid. No other information has been identified that could call into question the protectiveness of the final remedy.

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1.0 INTRODUCTION

This document presents the results of the Fourth Five-Year Review undertaken to determine whether or not the final remedy for Navy ERP Site 8B/SCL, located at JBAB in Washington, DC, is protective of human health and the environment.

The Navy prepared this Five-Year Review Report pursuant to Section 121(c) of the CERCLA, as amended by the Superfund Amendments and Reauthorization Act of 1986, and Section 300.430(f)(4)(ii) of the National Oil and Hazardous Substances Pollution Contingency Plan. A review of all remedial actions is required every five years when hazardous substances, pollutants, or contaminants remain above levels that permit unlimited use/unrestricted exposure. This periodic review and evaluation, hereinafter referred to as a five-year review, is intended to ensure that the selected remedial measures remain protective of human health and the environment, are functioning as designed, and that the necessary operation and maintenance (O&M) is being performed.

JBAB was established in October 2010 as a result of the 2005 round of Base Realignment and Closure process, and is comprised of the former Naval Support Facility Anacostia (NSFA), the former Bolling Air Force Base (BAFB), and the Bellevue Housing Area. The former BAFB Installation Restoration Program (IRP) site number for the SCL was LF-06, and the current Navy ERP site designation is Site 8B. The entire facility is located on 905 acres of land within the floodplain of the Potomac River and its river terraces, just south of the confluence of the Anacostia and Potomac rivers.

IRP/ERP activities, which are funded by the Defense Environmental Restoration Program (DERP), have been conducted at BAFB since the late 1980s (and at JBAB since 2010) to identify, characterize, and clean-up releases from contamination associated with past material handling and previously accepted disposal practices associated with past operations of the combined installations.

Reviews are required every five years after the initiation of remedial activities at a CERCLA site if contaminants are left on-site. The first five-year review conducted at BAFB was triggered by remedial measures at Site LF-06 (i.e., Site 8B) during 1998 (CH2M, 2004). It considered nine sites, including Site LF-06. The remedy completed for four of the sites (other than Site 8B) was protective of human health and the environment, and each of those sites was closed by a No Further Response Action Planned (NFRAP) Decision Document (DD) shortly after completion of the first review.

The second five-year review for BAFB IRP sites was conducted during 2010, and included updated information for five former BAFB IRP sites. These sites included the SCL as well as the two base-wide Operable Units (OUs), 14B/Base-wide Metals OU (formerly IRP Site SS-12) and 15B/Potomac River OU (formerly IRP Site SS-13) (Metcalf and Eddy [M&E], 2010).

As with the third, this Fourth Five-Year Review focuses only on Site 8B and has been prepared by Resolution Consultants as part of the Comprehensive Long-term Environmental Action Navy program under Contract No. N62470-11-D-8013, Contract Task Order (CTO) JU01, Modification 04 for JBAB. Figures are presented at the end of the document.

1.1 Five-Year Review Process

The United States Environmental Protection Agency (USEPA) has developed evaluation methods for consideration during preparation of a five-year review [USEPA Office of Solid Waste and Emergency Response (OSWER) Directive 9355.7-03B-9 (OSWER, 2001)]. This USEPA document was used for preparation of this report. The document review and data review components of the five-year review process are integrated throughout the report.

1.2 Five-Year Review Format

This five-year review consists of the following sections:

- **Introduction** - serves as an introduction and statement of purpose for the review; also includes an evaluation of Applicable or Relevant and Appropriate Requirements (ARARs) and the five-year review process.
- **Site History and Background** - provides an overview of JBAB and the SCL, including background and history; site chronology; and elements common to the SCL, including physical characteristics, land and resource use, and natural resources.
- **Remedial Actions** - includes discussions concerning all pending, completed, and ongoing remedial actions.
- **Progress since the Last Review**
- **Five-Year Review Process** - describes the five-year review process, including administrative components, site inspections, community involvement, interviews, and team members.

- **Technical Assessment** - addresses the three technical assessment questions to determine whether the selected remedial actions remain protective of human health and the environment.
- **Issues, Recommendations, and Follow-Up Actions** - addresses issues identified by the five-year review process and provides recommendations for follow-up actions, if necessary.
- **Protectiveness Statement** - provides the Site 8B protectiveness statement.
- **Next Review** - provides a schedule for the next five-year review.
- **References** - provides the references used during preparation of this document.

Attachment A provides community notification components. Attachment B includes the Five-Year Site Inspection Documentation.

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2.0 SITE HISTORY AND BACKGROUND

2.1 Base Background

JBAB is located in the southeastern portion of Washington, DC, situated between the Potomac and Anacostia rivers and Interstate 295, in the Anacostia and Congressional Heights areas of the city (Figure 1).

2.1.1 Physical Characteristics

JBAB is located within the Pleistocene-aged lowland deposits of the Atlantic Coastal Plain Physiographic Province. This province is a large, wedge-shaped belt of Cretaceous to recent unconsolidated alluvial deposits consisting of mixtures of interbedded clay, silt, sand, and gravel. The original surface geology at JBAB has been changed by re-grading and placement of fill along the river shorelines throughout the life of the Base. According to Base personnel, as much as 20 feet of fill material has been placed atop the alluvium in some areas. The original river terraces and their associated deposits have primarily been used as fill throughout the Base area.

The uppermost hydrogeologic unit at JBAB consists of an unconfined water table aquifer composed of alluvium, river-terrace deposits, and manmade and natural fill. In many areas of the Base, the upper portion of the unconfined aquifer (i.e., to a depth of 20 – 30 feet below ground surface [bgs]) is very heterogeneous and relatively impermeable compared to sand and gravel strata deeper in the water bearing unit. Groundwater movement in the aquifer in the vicinity of Site 8B is generally northwest toward the Potomac River.

The unconfined aquifer is underlain by a series of confining units and a regional aquifer system. This system is referred to as the Potomac Group in the District of Columbia and Maryland, and is composed of interbedded sands and clays that form a series of aquifers and confining units. All groundwater in the District of Columbia is protected for its beneficial uses, including drinking water. The Patuxent Aquifer, part of the Potomac Group, is approximately 100 feet bgs at JBAB, and an important resource for domestic, industrial, and municipal water supply purposes in Maryland further east of JBAB.

2.1.2 Land and Resource Use

JBAB is bordered on the north and northwest by the Anacostia River, on the south by the Naval Research Laboratory (NRL), on the west by the Potomac River, and the east by Interstate Highway 295. Washington Reagan National Airport is directly west of the Base, across the Potomac River. The majority of buildings on Base are related to housing units and administrative activities, with the remaining portions of the Base covered primarily by turf and planted trees. There are no woods or shrubbery areas on the Base.

The surficial aquifer is not used as a drinking water resource at JBAB, nor does it supply water for any other use (such as industrial or agricultural) within the Base boundaries. The underlying regional Patuxent Aquifer is reportedly used on the Base as an alternate water supply. Water is supplied to the Washington, DC region from the Potomac River by the United States Army Corps of Engineers Washington Aqueduct Division using intakes located approximately 13 miles upstream of the Base.

2.1.3 Base Environmental History

The ERP at JBAB is currently under the direction of NAVFAC Washington. As the Base is not subject to a Federal Facilities Agreement nor has it met the criteria for NPL status, JBAB is referred to as a non-NPL CERCLA site. BAFB is listed on the Federal Docket and identified as a Base with potential environmental concerns. The ERP is being conducted pursuant to the environmental laws and regulations governing Department of Defense (DoD) sites, including CERCLA Section 120, Executive Order 12580, and the statutory provision of the DERP.

For the former NSFA, NAVFAC Washington conducted desktop evaluations of available information for 15 current or former buildings at the Anacostia Annex to evaluate the need for further investigation and/or remediation. The desktop evaluation report identified nine buildings for no further action, two buildings for further action as part of the underground storage tank program to address petroleum releases, and four buildings for further action under the ERP to address potential historic spills and releases.

The Air Force actively engaged in environmental protection and remediation programs for BAFB since 1985, beginning with the development of a Base Comprehensive Plan. An initial Phase I Records Search was the first investigation conducted at the Base concerning potentially hazardous sites. The Phase I Records Search, conducted in 1985, identified areas of concern (AOCs) that might potentially cause threats to human health and the environment as a result of past storage, handling, and disposal of hazardous material. More AOCs were identified at BAFB as part of Preliminary Assessment (PA)/Site Inspection (SI) activities conducted during 1993 through 1995. The PA/SI was intended to identify all potentially contaminated areas on BAFB. Additional IRP information was developed during the Base-Wide Site Investigation (BWSI), which was conducted in multiple phases (1994, 1995, 1998, and 2000) and completed in 2002.

Additional AOCs were identified in 2001 during a comprehensive review of the BWSI with the USEPA and District of Columbia Department of Health Environmental Health Administration, now known as the District Department of Energy and Environment (DOEE). Additional review of historical records, field inspections, and interviews resulted in the identification of 53 AOCs at locations where potentially hazardous materials were used, stored or spilled as part of normal

operations for the former BAFB. Based on spatial distribution, some of the AOCs were combined into zones or were incorporated into other IRP sites.

2.2 Site 8B Background

As shown on Figure 2, the SCL is located in the southwestern corner of the former BAFB portion of JBAB and occupies approximately 6 acres. The land surface of the SCL is relatively flat, with surface elevations ranging from approximately 8 feet above mean sea level (amsl) near the river to 17 feet amsl in the most eastern portion. The southern portion of Site 8B is used by NRL as a parking and equipment storage area. A fence encloses the portion of the site used by NRL, and direct access from the JBAB property is obtained through a locked gate in the fence at the north end of the NRL parking lot.

Site 8 was initially started by filling in an area along the shoreline of the Potomac River between the years 1941 and 1944. During World War II, the Potomac River was dredged to allow larger ships to travel north on the river to the Washington Navy Yard, and it is likely that some dredge spoil from the river was used to fill this area along the shoreline. Subsequently, the land along the shoreline was built out into the river and raised to help control flooding of Base facilities using fill material that included rubble from building and runway demolition. In 1944, an incinerator was built on the site to burn refuse. A large concrete pad was built next to the incinerator to store coal and other material, such as road salt, sometime between 1944 and 1955. The incinerator was demolished in 1974. Various materials, stockpiles, drums, and vehicles were stored at the site until approximately 1990.

2.3 Conceptual Site Model

Key environmental and contaminant-related characteristics of Site 8B are as follows:

- Stratigraphy – Soils in the unsaturated zone and unconfined aquifer beneath the Site 8B asphalt cap are heterogeneously intermixed and composed of native materials (e.g., silt, sand, clay, gravel), dredged spoils, and imported fill. The variable composition of the soil tends to retard the vertical and lateral movement of liquids.
- Unconfined Aquifer – The surficial aquifer at JBAB, including Site 8B, is generally composed of a shallow zone (~0-30 feet bgs) primarily consisting of intermixed silt, sand, and clay, and a deeper zone (~30-60 feet bgs) containing sand and gravel. Although the shallow and deep portions of the unconfined aquifer are hydraulically interconnected, water quality differences between the two zones indicate molecular diffusion and migration of dissolved-phase constituents are generally inhibited.
- Hydraulic Gradient – At Site 8B and throughout the Base, groundwater in the unconfined aquifer generally flows from east to west (toward the Potomac River) but is characterized by relatively low hydraulic gradients (Figure 3).
- Spatial Variability - The spatial variability of groundwater quality indicators (e.g. pH, oxidation-reduction potential [ORP]) at Site 8B and throughout the Base is significant. In many

instances, certain water quality conditions are highly localized in the vicinity of a particular well, and are not apparent in adjacent wells. The variability of these characteristics is associated with the heterogeneity of subsurface soils and fill material, geochemical conditions affecting the dissolution or immobilization of metals, several of which are chemicals of potential concern (COPC), and low hydraulic gradients in parts of the Base, including Site 8B, which minimize groundwater flow and COPC migration.

- Geochemical Conditions – Highly localized subsurface geochemistry in certain areas of the site tends to produce reducing conditions (i.e., negative ORP values), which enhance the dissolution of metals from solid matrices, thereby increasing the concentration of metals in groundwater. Conditions causing these reducing environments are associated with natural (e.g., decomposition of organic materials in former wetlands areas) and man-made (e.g., land filling, placement of dredged spoils, and the degradation of organic compounds released as a result of historic site operations) factors.
- Chemicals of Potential Concern - COPC identified for SCL surface and subsurface soils at concentrations exceeding regulatory criteria are semi-volatile organic compounds (SVOCs) including petroleum fuel-related polycyclic aromatic hydrocarbons (PAHs) benzo(a)pyrene and dibenz(a,h)anthracene, the polychlorinated biphenyl (PCB) Aroclor-1260, and metals arsenic, beryllium, iron, manganese and vanadium. Groundwater COPC include the same metals as soil.
- Fate and Transport of COPC - Potential transport pathways for COPC migration from SCL to the Potomac River are primarily storm-water runoff (physical transport of soil particles with adsorbed COPC and storm-water with dissolved phase COPC) and groundwater discharge (migration of dissolved-phase COPC).
- Potential Receptors and Exposure Pathways – Potential human health risk at Site 8B for direct contact with surface and subsurface soil and groundwater by construction workers, and hypothetical future child and adult residents is prevented by the soil and asphalt caps, fencing, and ICs. No ecological exposure risks were identified during the remedial investigation.

2.4 Basis for Remedial Action

The need for remedial action at the SCL was based on site history, the nature and extent of contamination, and the results of human health risk assessment. Each of these is discussed in the following subsections.

2.4.1 History of Contamination

Investigation of Site 8B began in 1991 with the Preliminary Investigation, which was completed in response to the discovery of petroleum-contaminated soils unearthed during regrading activities for construction of the NRL parking lot. Suspected sources of contamination included materials used to fill the area as well as material formerly stored or disposed at the SCL such as coal, road salt, vehicle fluids, refuse that was burned at the former incinerator, and incinerator ash.

In 1992, Phase I of the Remedial Investigation (RI) was completed to assess the presence of buried materials at the site. The study also included the collection of surface soil samples and sediments from the Potomac River shoreline. The Phase I RI was followed by a magnetometer survey by the NRL to determine the amount of buried ferrous material in the NRL parking area of the site.

In July and August of 1994, Phase II of the RI was completed, which included collecting subsurface soil samples and installing groundwater monitoring wells. Phase III of the RI was completed in February through April of 1995 and focused on delineating the fill area and establishing groundwater flow patterns at the site. As part of Phase III, in September 1995, groundwater samples were obtained from certain monitoring wells and analyzed for pesticides and PCBs only. In April 1997, two test pits were excavated at the request of the District of Columbia Department of Health (now known as DOEE) to investigate the potential presence of unexploded ordnance (UXO) at the site. There were no UXO materials identified.

Results of the RI indicated fill extends from the river shore east across McGuire Avenue into the 1400 Housing Series. The approximately 4 to 7 feet thick upper fill zone consists of silty sand, gravel, and rubble (including cinders, coal, wood). The lower fill zone, approximately 3 to 10 feet thick, consists of silty clay and sand. Areas of surface and subsurface soil in the NRL gravel parking area were found to have been impacted by SVOCs, petroleum hydrocarbons, PCBs, and inorganics.

Additional details regarding the SCL are presented in the Long-Term Groundwater Monitoring Project Plans (Baker, 1999; 2000; 2001), the Revised Final Remedial Investigation Report (Baker, 1998) and the Final DD for the SCL (Baker, 2001).

The chronology of the SCL is presented below in Table 2-1.

2.4.2 Summary of Site Risks

A risk assessment was performed as part of the RI (Baker, 1998). Carcinogenic and non-carcinogenic risks associated with potential exposures to surface soil, subsurface soil, and groundwater for current and future land uses were evaluated and deemed acceptable by the USEPA. The risk assessment indicated potential risks to hypothetical future adult and child military residents that exceeded acceptable levels due to exposure to PAHs, Aroclor-1260, and various metals in the on-site surface soil, and metals in groundwater at the SCL (Baker, 1998).

Table 2-1. Southwest Corner Landfill Chronology

Event	Date
Preliminary Investigation (petroleum contaminated soils)	January 1991
RI - Phase I (soil, river sediment)	July 1992
RI - Phase II (soil, groundwater)	July and August 1994
RI - Phase III (soil, groundwater)	February-April 1995
Groundwater sampling event	September 1995
Test pits excavated (UXO investigation)	April 1997
Pre-design field sampling	June 1996
RI/Feasibility Study Report	January 1998
Site remediation (remove contaminated soils, install asphalt cover)	1998
Final DD	July 31, 2001
Post-remedial LTM - Round 1	October 1999
Post-remedial LTM - Round 2	October 2000
Post-remedial LTM - Round 3	October 2001
Post-remedial LTM - Round 4	October 2002
Post-remedial LTM - Round 5	November 2003
First Five-Year Review	September 2004
Post-remedial LTM - Round 6	November 2004
Land Use Control Assurance Plan	July 2005
Post-remedial LTM - Round 7	November 2006, March 2007 (MW16[†])
Post-remedial LTM - Round 8	October-November 2008
Second Five-Year Review	June 2010
Post-remedial LTM - Round 9	April 2010
Post-remedial LTM - Round 10	September 2011
Post-remedial LTM - Round 11	March 2013
Post-remedial LTM - Round 12	November 2014
Post-remedial LTM - Round 13	April 2016
Third Five-Year Review	November 2016
Post-remedial LTM – Round 14	November 2017
Post-remedial LTM – Round 15	December 2019
Fourth Five-Year Review	November 2020

[†] Monitoring well MW16 was installed in March 2007 and sampled as part of LTM Round 7.

3.0 REMEDIAL ACTIONS

Remediation of Site 8B was completed in 1998 and consisted of excavation (to a depth of 3 feet bgs) of "hot spots" of contaminated soil (e.g., petroleum hydrocarbons, benzo(a)pyrene), construction of an asphalt-covered parking lot over the southern portion of the site, construction of a grass/soil cover (2 feet of compacted fill and topsoil) over the northern portion of the site, and a long-term groundwater monitoring program. The remedy also included land use controls to further prevent human health exposure to contaminants in soil and groundwater that pose a potential unacceptable risk to human health. The land use controls are documented in a site-specific Land Use Control Implementation Plan (LUCIP) developed specifically for Site 8B (JBAB, 2015), and consist of the following ICs:

- Prohibits changes from current site land uses without review and approval of the Installation Commanding Officer or his/her designee
- Restricts land use within the fenced southern portion of Site 8B by NRL to non-residential use per terms of permit DAF 96-02-21, including maintenance of the asphalt parking lot cap
- Prohibits intrusive development and/or excavation within the open green northern portion of Site 8B without review and approval of the Installation Commanding Officer or his/her designee
- Prohibits groundwater well installation or use of groundwater beneath the site without review and approval of the Installation Commanding Officer or his/her designee

Note that site monitoring wells (designated with SCL- prefix, hereafter eliminated for brevity) MW01, MW02 and MW03 were destroyed as part of the remedial activities. The asphalt cap was installed to prevent receptor exposure, and infiltration of precipitation, which could cause potential leaching of residual contaminants remaining in the surface soil into the water table aquifer at the site. This remedial action mitigated health risks to JBAB housing residents adjacent to the landfill while allowing residents access to the portion of the site that JBAB uses. The LTM program was instituted as one of the post-remedial action activities and is intended to monitor the effectiveness of the remedial action.

Fifteen previous annual rounds of LTM have been performed at the SCL since 1999. The first round of LTM was completed in October 1999 and included sampling of nine monitoring wells (MW04 through MW12). In 2000, three additional monitoring wells (MW13, MW14, and MW15) were installed to establish the site wide LTM well network of 12 wells (i.e., MW04 through MW15). LTM Rounds 2 - 6 were conducted in October/November 2000, 2001, 2002, 2003, and 2004, respectively, and included all 12 monitoring wells. Samples were analyzed for Target Compound List (TCL) volatile organic compounds (VOCs), TCL SVOCs, chlorinated pesticides and PCBs,

Target Analyte List (TAL) metals, and total petroleum hydrocarbons diesel-range organics (TPH-DRO) and gasoline-range organics (TPH-GRO).

In April 2000, Round 2 included a tidal study to assess the effect of tidal fluctuations in the Potomac River on the groundwater potentiometric surface for the SCL. The study involved monitoring water levels in select site monitoring wells and the surface water level in the Potomac River for a year (April 2000 until April 2001). Results of the tidal study indicated groundwater is affected by tidal changes in the river. Groundwater levels were observed to exhibit a sinusoidal tidal pattern corresponding to associated tidal fluctuations with 0.1- to 0.2-foot variations in well water levels resulting from 1 to 1.5-foot changes in river gauge elevation. Local variations in flow direction and gradient occur as the result of changes in river gauge elevation. Groundwater mounding was evident beneath the NRL parking lot near monitoring wells MW05 and MW12, and groundwater on either side of the resulting divide flows in different directions. Overall, however, groundwater movement is west towards the river.

Based on the review of the Round 6 LTM results, the JBAB Regulatory Team, consisting of representatives from the USEPA Region III, DOEE and JBAB, agreed to optimize monitoring requirements for Round 7. This included performing sampling of only six of the twelve site wells (MW04, MW06, MW08, MW11, MW12, and MW14). In addition, analyses for SVOCs, chlorinated pesticides and PCBs, and TPH-GRO were eliminated since there was little or no change in trends or concentrations of these contaminants in Round 6 LTM (2004) compared to previous LTM results from 2001, 2002, and 2003. Furthermore, as described in the Round 7 LTM report (M&E, 2007), the DOEE Water Quality Division (WQD) required JBAB to install a replacement well for MW04, located close to the Potomac River shoreline to evaluate the potential down-gradient migration of contaminants. Well MW04 is located in the center of the parking lot in an area believed to be where road salt was stored. It has historically exhibited inconsistent results for metals (including elevated levels of sodium) as well as TPH-DRO exceeding the DOEE standard for Round 6. As a result, monitoring well MW16 (Figure 3) was installed and sampled for all parameters as part of the Round 7 activities.

Based on the review of previous results, the JBAB Regulatory Team agreed to revise monitoring requirements beginning with Round 8 (M&E, 2009). This included sampling eight site wells (MW04, MW06, MW11, MW12, MW13, MW14, MW15, and MW16) for VOCs, TPH-DRO, and metals. Four wells (MW04, MW06, MW11, and MW12) were also analyzed for SVOCs to verify that these compounds were still absent and not leaching into the groundwater from capped materials in the vadose zone. The JBAB Regulatory Team also agreed that going forward, the LTM should be conducted at a frequency of 18 months (alternately in the fall and spring) to capture potential seasonal variations.

In 2008, a new deep well, BG08-MW11, was installed as background well paired with shallow well, MW12, as part of the Site 15B/Potomac River Operable Unit sentinel well network. The Round 9 and Round 10 events included the sampling of eight wells with BG08-MW11 replacing well MW15.

In December 2011, due to construction of the new Joint Air Defense Operations Center facility (JADOC), five site monitoring wells (MW07, MW08, MW09, MW10, and MW11) that were located within the construction footprint of the facility were abandoned in accordance with DOEE requirements.

The JBAB Regulatory Team agreed that Round 11 and Round 12 would entail the sampling of the following six site wells: MW06, MW12, MW13, MW14, MW16, and BG08-MW11.

Required O&M activities completed during the fall of 2015 included the rehabilitation of wells, MW05, MW06 and MW13, and the abandonment of wells, MW04 and MW12, with the installation of replacement well, MW12R. The subsequent Round 13 and Round 14 events entailed sampling and analysis of five of the same site wells (MW06, MW13, MW14, MW16, and BG08-MW11) plus replacement well MW12R.

The Round 14 LTM report recommended increasing the frequency of LTM from an 18-month period to a 24-month period (i.e., biennial, optimized when possible to capture dry- and wet-weather conditions), with periodic evaluation of opportunities for additional remedial monitoring optimization at each Five-Year Review. The JBAB Regulatory Team approved this change in LTM frequency at the 11 March 2019 Team meeting, and Round 15 including sampling of MW06, MW13, MW14, MW16, MW12R, and BG08-MW11 was conducted accordingly. Site inspections will continue to be conducted annually.

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4.0 PROGRESS SINCE THE LAST REVIEW

Since the Third Five-Year Review, two rounds of LTM sampling have been performed at the SCL (i.e., Rounds 14 and 15).

The Round 14 LTM event consisted of the inspection, purging and sampling of the same six site wells as in Rounds 9 through 13: MW06, MW12R, MW13, MW14, MW16, and BG08-MW11. Samples were collected on 10 through 14 November 2017 and analyzed for VOCs, TPH-DRO, and total TAL metals (Resolution Consultants, 2019).

The Round 15 LTM event entailed sampling of the same six wells for the same analyses as Round 14. Well sampling was conducted on 13 and 14 November 2019 (Resolution Consultants, 2020).

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5.0 FIVE-YEAR REVIEW PROCESS

5.1 Administrative Components

The DOEE was notified of the initiation of the Five-Year Review in May 2020. Mr. David Collins, the Remedial Project Manager (RPM) for NAVFAC Washington, led the Five-Year Review team. Mr. Dev Murali, RPM for the DOEE, and Xochitl Montano and Ricardo Jaimes for DOEE WQD, participated in the review. Resolution Consultants prepared the review document under contract to NAVFAC Washington. The components of the review process included the following:

- Community involvement
- Document review
- Data review
- Site inspection

5.2 Community Involvement

A public announcement was published on the Air Force JBAB website (www.jbab.jb.mil) and in the *JBAB Facilities and Services Update* newsletter on 30 November 2020 indicating that a Five-Year Review has been completed for Site 8B at JBAB. The purpose of the public notice is to inform members of the community of the Five-Year Review results, and to provide information on where the Five-Year Review document, as well as supporting documents used for the review, can be obtained for inspection. The documents and results of the review are available to the public at the locations identified below:

The Bellevue (William O. Lockridge) Neighborhood Library
115 Atlantic Street SW
Washington, D.C. 20032
(202) 243-1185

The JBAB Library
Building 4439, Tinker Street
Washington, D.C. 20332
(202) 767-5578

Community notification components are provided in Attachment A.

5.3 Data Review

This five-year review consisted of reviews of site-specific documentation and on-site inspection to identify potential risks to human health and the environment, confirm the implemented remedy is operational and functioning to meet remedial action objectives (RAOs), and to assess remedy

performance and continued protection of human health and the environment. The review included ARARs and prior five-year reviews to ensure past issues associated with protectiveness have been addressed in accordance with recommendations and current requirements. Since LTM is a component of the Site 8B remedy, data from the previous five LTM events since the remedy was implemented were also reviewed by the JBAB Regulatory Team.

5.4 Document Review

The Five-Year Review included a review of the following relevant investigation and decision documents:

- Baker. 2001. Final Decision Document, Southwest Corner Landfill, Bolling Air Force Base, Washington, D.C. July 2001
- Land Use Control Implementation Plan, IRP Site LF-06/Southwest Corner Landfill, 28 July 2005, revised 5 July 2016.
- Resolution Consultants, 2016. 2016 Third Five-Year Review, Site 8B - Southwest Corner Landfill, Joint Base Anacostia-Bolling, Washington, D.C. November 2016.
- Resolution Consultants, 2019. Site 8B - Southwest Corner Landfill Long-Term Groundwater Monitoring Report No.14, Joint Base Anacostia-Bolling, Washington, D.C. March 2019.
- Resolution Consultants, 2020. Site 8B - Southwest Corner Landfill Long-Term Groundwater Monitoring Report No.15, Joint Base Anacostia-Bolling, Washington, D.C. July 2020.

5.5 Site Inspection

Site inspections of the SCL are performed annually and in conjunction with each LTM event. The purpose of the inspections is to assess the protectiveness of the remedy and identify any maintenance needed for the asphalt cap and monitoring wells. This includes inspections of the access roads, the fence, entry gates, asphalt and vegetative cover, and rip-rap along the Potomac River. The inspections are performed by walking transects at approximate 100-foot centers and the perimeter of the site while noting potential issues such as stressed vegetation, erosion, cracks or damage to the portion of Site 8B covered with asphalt pavement, and subsidence/settlement.

Except for minor cracks in the parking lot surface, no significant deficiencies were observed during the site inspections from 2017 through 2019. The JBAB Regulatory Team conducted a site inspection in July 2020 to verify site conditions. Attachment B includes the Five-Year Review Site Inspection Documentation.

5.6 ARAR Review

The Comprehensive Five-Year Review Guidance (OSWER, 2001) discusses the USEPA view of reviewing ARARs as documented in the NCP 55 FR 8757 (March 8, 1990). The NCP freezes ARARs

at the time of the Record of Decision or DD signature; however, the remedy will be reviewed every five years, considering new or modified requirements to ensure the remedies remain protective. Since these requirements contribute to the evaluation of remedy protectiveness, the Comprehensive Five-Year Review Guidance specifies that an evaluation of the modified requirements on the protectiveness of the original selected remedy be conducted. When a change to an ARAR necessitates further action, based on concurrence with DoD and the regulatory community, such action may be implemented at any time through an Explanation of Significant Differences, or a ROD/DD amendment.

During preparation of this document, ARARs were reviewed for significant changes that would alter or augment the protectiveness of the selected remedial measures. The following lists of chemical-specific, location-specific and action-specific ARARs were reviewed for significant changes:

Chemical-Specific ARARs

- Safe Drinking Water Act
- Clean Water Act
- Toxic Substances Control Act
- Water Quality Standards of the District of Columbia
- Soil Quality Standards of the District of Columbia

Location-Specific ARARs

- Clean Water Act
- Coastal Zone Management Act
- Federal Endangered Species Act
- Fish and Wildlife Coordination Act
- Rivers and Harbors Act

Action-Specific ARARs

- DC Department of Consumer and Regulatory Affairs for Earth Grading and Surface Water Management

The review indicated that the selected remedy is in full compliance with ARARs and provides long-term effectiveness and permanence.

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6.0 TECHNICAL ASSESSMENT

6.1 Technical Questions

Question A: Is the remedy functioning as intended by the decision documents?

The review of IRP documents, ARARs, risk assumptions, LTM data, and site inspection indicates the prescribed remedial actions for Site 8B are functioning as intended by the DD. The hot spot removal of contaminated soils and the subsequent capping of the site have achieved remedial objectives by minimizing or eliminating the migration of contaminants from soil to groundwater and surface water and preventing exposure pathways, which could result in direct contact with or ingestion of contaminants in soil.

Since October 1999, the groundwater LTM program has been conducted as stipulated in the site DD. The LTM program is designed to ensure that site conditions are documented and remain stable, and groundwater monitoring wells, the soil cover, and asphalt cap are maintained adequately. Evaluation of groundwater quality data from the LTM program confirms that groundwater water quality conditions remain stable. The LTM program will continue into the foreseeable future and provide data on the spatial and temporal distribution of organics and select metals in the groundwater. As needed and with JBAB Regulatory Team concurrence, the LTM program may be modified in the future based on groundwater quality changes.

Soil and fill materials at Site 8B are relatively tight and very heterogeneous as reflected by localized variations in groundwater flow direction and low water yield from some wells. Although the overall flow of groundwater at Site 8B is west towards the river, the hydraulic gradient is low.

As indicated by the temporal consistency of most groundwater analytes at each LTM well, the asphalt cap on the portion of Site 8B appears to be effectively controlling infiltration of precipitation and minimizing the leaching and transport of subsurface contaminants from soil into groundwater.

The Site 8B LUCIP includes the following ICs:

- Prohibits changes from current site land uses without review and approval of the Installation Commanding Officer or his/her designee
- Restricts land use within the fenced southern portion of Site 8B by NRL to commercial use per terms of permit DAF 96-02-21, including maintenance of the asphalt parking lot cap

- Prohibits intrusive development and/or excavation within the open green northern portion of Site 8B without review and approval of the Installation Commanding Officer or his/her designee
- Prohibits groundwater well installation or use of groundwater beneath the site without review and approval of the Installation Commanding Officer or his/her designee

With the exception of the approved well closures for the previous construction of the JADOC facility and the well replacement/rehab activities (Section 4), no activities were observed during the five-year review period that would have violated these control measures. The asphalt cap and the surrounding area were undisturbed; however, numerous pavement cracks and several small areas of degraded asphalt were observed during the April 2016 LTM event. Sealing of pavement cracks and patching of degraded asphalt was completed in October 2016 to maintain the integrity of the asphalt cap that comprises the NRL parking area. The fence around the site is intact and in good condition.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?

The exposure assumptions, toxicity data, cleanup levels, and RAOs used to select and monitor the remedial actions action at Site 8B are still valid. There have not been changes in the physical conditions of the site that would affect the protectiveness of the remedy. The exposure assumptions used to develop the human health risk assessment included both current exposures and potential future exposures and are consistent with the DoD and the Navy management of this site. These assumptions are conservative and reasonable in evaluating risk, and no changes to these assumptions are warranted. There has been no change to the standardized risk assessment methodology that could affect risk findings that serve as the basis for the protectiveness of the remedy.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

There has not been any new information or data to suggest the remedial actions implemented in accordance with the DD are no longer valid. LTM data have been and will continue to be used to evaluate groundwater quality at Site 8B for changes in concentration trends of COPC. There is no new evidence to date indicating the site contains hazardous wastes or constituents being released to the surrounding environment. No weather-related events or natural disaster impacts have affected the protectiveness of the remedy. There is no other information that calls into question the protectiveness of the remedy.

6.2 Technical Assessment Summary

Based on the documents and data reviewed, the remedy for Site 8B is functioning as intended by the DD, and ICs continue to maintain conditions on the site that ensure protectiveness. The LTM program will continue to provide data for the foreseeable future to ensure that site conditions are stable, and the remedial actions remain effective.

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7.0 ISSUES, RECOMMENTATIONS, AND FOLLOW-UP ACTIONS

The ARARs listed in Section 5.6 remain applicable to Site 8B. No other outstanding issues exist at the site.

Remedial action is complete at Site 8B, and LTM is on-going. Recommendations and follow-up actions include:

- Continue implementation of LTM activities indefinitely, including groundwater monitoring and annual inspection of the site soil cover and asphalt parking lot cap.
- Continue LTM at a frequency of every 24 months (biennial), optimized when possible to capture dry- and wet-weather conditions, with periodic evaluation of opportunities for additional remedial monitoring optimization at each 5 Year Review.
- Continue using USEPA “low-flow” groundwater sampling methodology to generate consistent and comparable data to ensure that groundwater conditions are stable, and the asphalt cap have been effective.
- The site wells to be sampled during future LTM events should continue to include three shoreline wells (MW06, MW13, MW16), and three interior wells (MW12R, associated deep well BG08-MW11, and MW14) depicted on Figure 3.
- Analyses of groundwater samples for future LTM events should continue to include VOCs, TPH-DRO and TAL metals.
- Pending regulatory approval, consider integrating the SCL LTM program into the Base-wide sentinel groundwater-monitoring well network that is anticipated to be part of the remedy for ERP Sites 14B and 15B to optimize future groundwater monitoring.

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8.0 PROTECTIVENESS STATEMENT

The remedy at Site 8B is protective of human health and the environment. The remedy is functioning as intended. The current and expected future land use is consistent with the ICs established for the site. The exposure assumptions and toxicity data used at the time of the final remedy selection are still valid. No other information has been identified that could call into question the protectiveness of the final remedy.

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9.0 NEXT REVIEW

The next (i.e., fifth) five-year review for Site 8B should be completed before November 2025, five years from the date of this review.

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10.0 REFERENCES

AECOM. 2011. Site LF-06 Southwest Corner Landfill Long-Term Groundwater Monitoring Report No.10, Bolling Air Force Base, Washington, D.C. November 2011.

Baker Environmental, Inc. (Baker). 2001. Final Decision Document - Southwest Corner Landfill. Bolling Air Force Base, Washington, D.C. July 31, 2001.

Baker Environmental, Inc. (Baker). 1998, Revised Final Remedial Investigation Report, Southwest Corner Landfill, Bolling Air Force Base, Washington, D.C. January 1998

Baker Environmental, Inc. (Baker). 1999, 2000, 2001, Long-Term Groundwater Monitoring Project Plans for the Southwest Corner Landfill, Bolling Air Force Base, Washington, D.C.

CH2M Hill Federal Group, LTD (CH2M). 2004. Final Five-Year Review, Bolling Air Force Base, Washington, D.C. September 2004.

Joint Base Anacostia Bolling (JBAB). 2015. Land Use Control Implementation Plan, Site 8B/Southwest Corner Landfill, Joint Base Anacostia-Bolling, Washington, D.C. September 2015.

Metcalf and Eddy (M&E). 2007. Site LF-06 Southwest Corner Landfill Long-Term Groundwater Monitoring Report No. 7, Bolling Air Force Base, Washington, D.C. September 2007.

Metcalf and Eddy (M&E). 2009. Site LF-06 Southwest Corner Landfill Long-Term Groundwater Monitoring Report No. 8, Bolling Air Force Base, Washington, D.C. August 2009.

Metcalf and Eddy (M&E). 2010. Second Five-Year Review Report, Bolling Air Force Base, Washington, D.C. June 2010.

OSWER, 2001. Comprehensive Five-Year Review Guidance. OSWER Directive 9355.7-03B-P. USEPA Office of Solid Waste and Emergency Response. Washington, D.C. June 2001.

Resolution Consultants, 2016. 2016 Third Five-Year Review, Site 8B - Southwest Corner Landfill, Joint Base Anacostia-Bolling, Washington, D.C. November 2016.

Resolution Consultants, 2019. Site 8B - Southwest Corner Landfill Long-Term Groundwater Monitoring Report No.14, Joint Base Anacostia-Bolling, Washington, D.C. March 2019.

Resolution Consultants, 2020. Site 8B - Southwest Corner Landfill Long-Term Groundwater Monitoring Report No.15, Joint Base Anacostia-Bolling, Washington, D.C. July 2020.

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Figure 1. JBAB Location Map

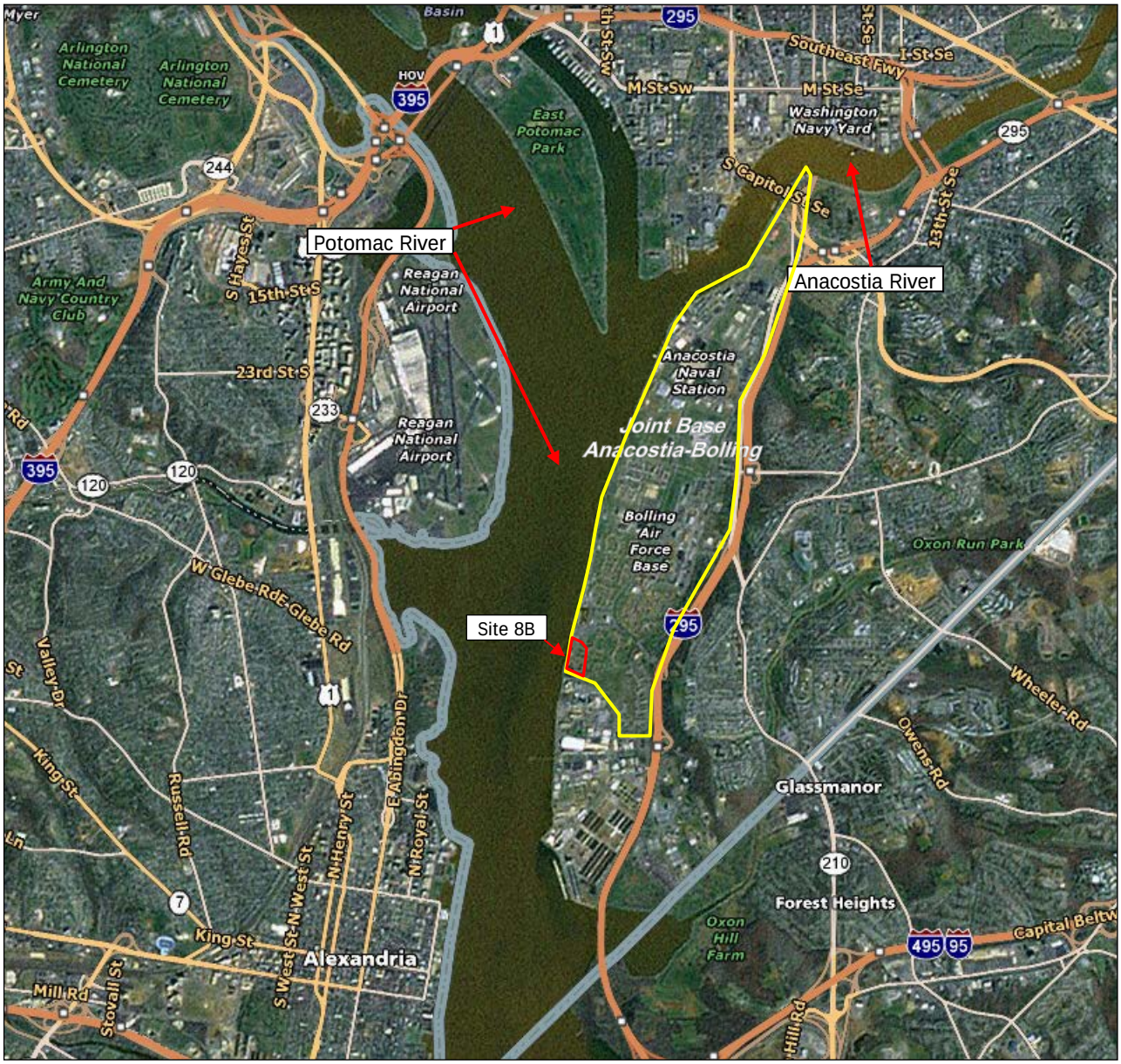

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Figure 2. Site 8B/Southwest Corner Landfill Location Map

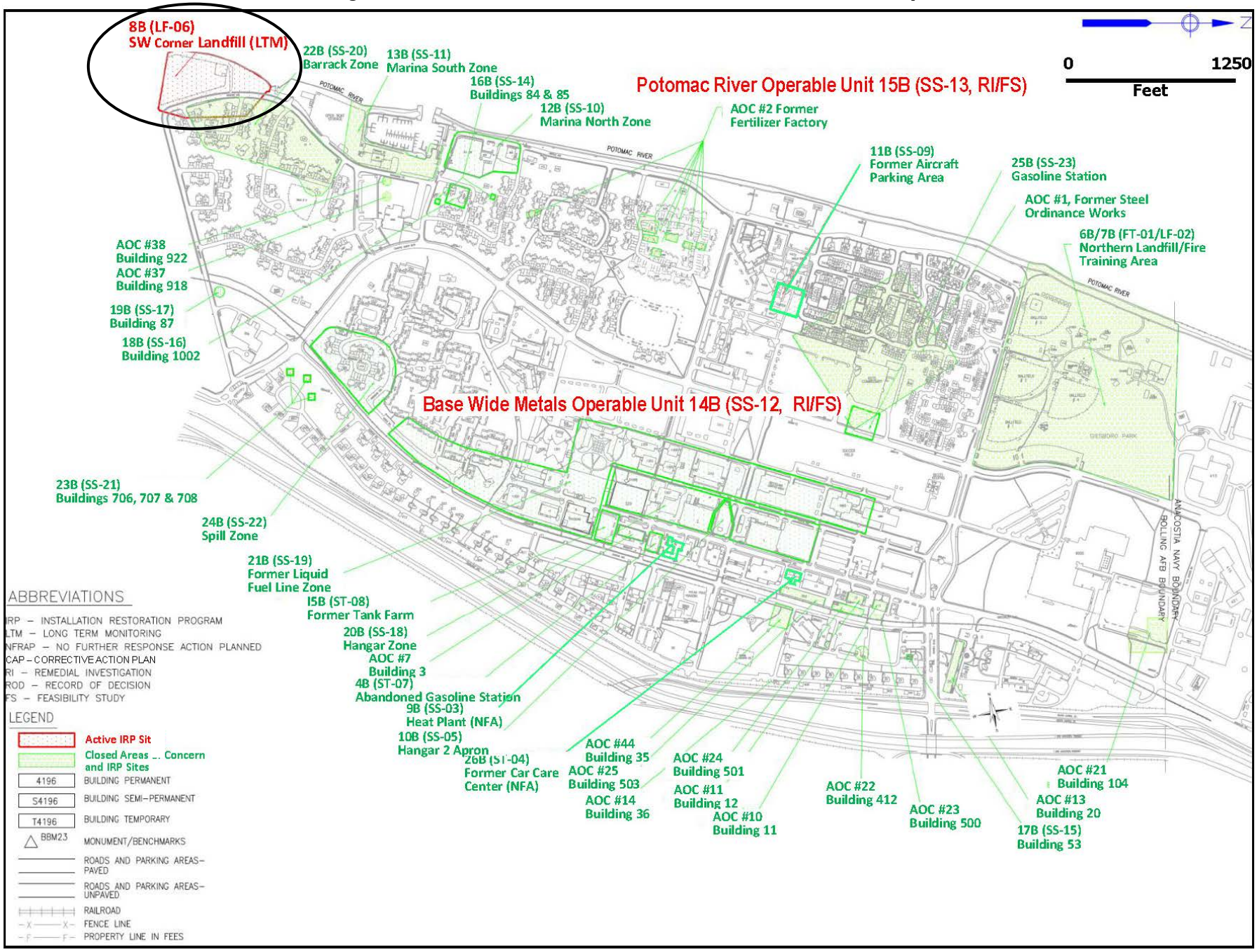

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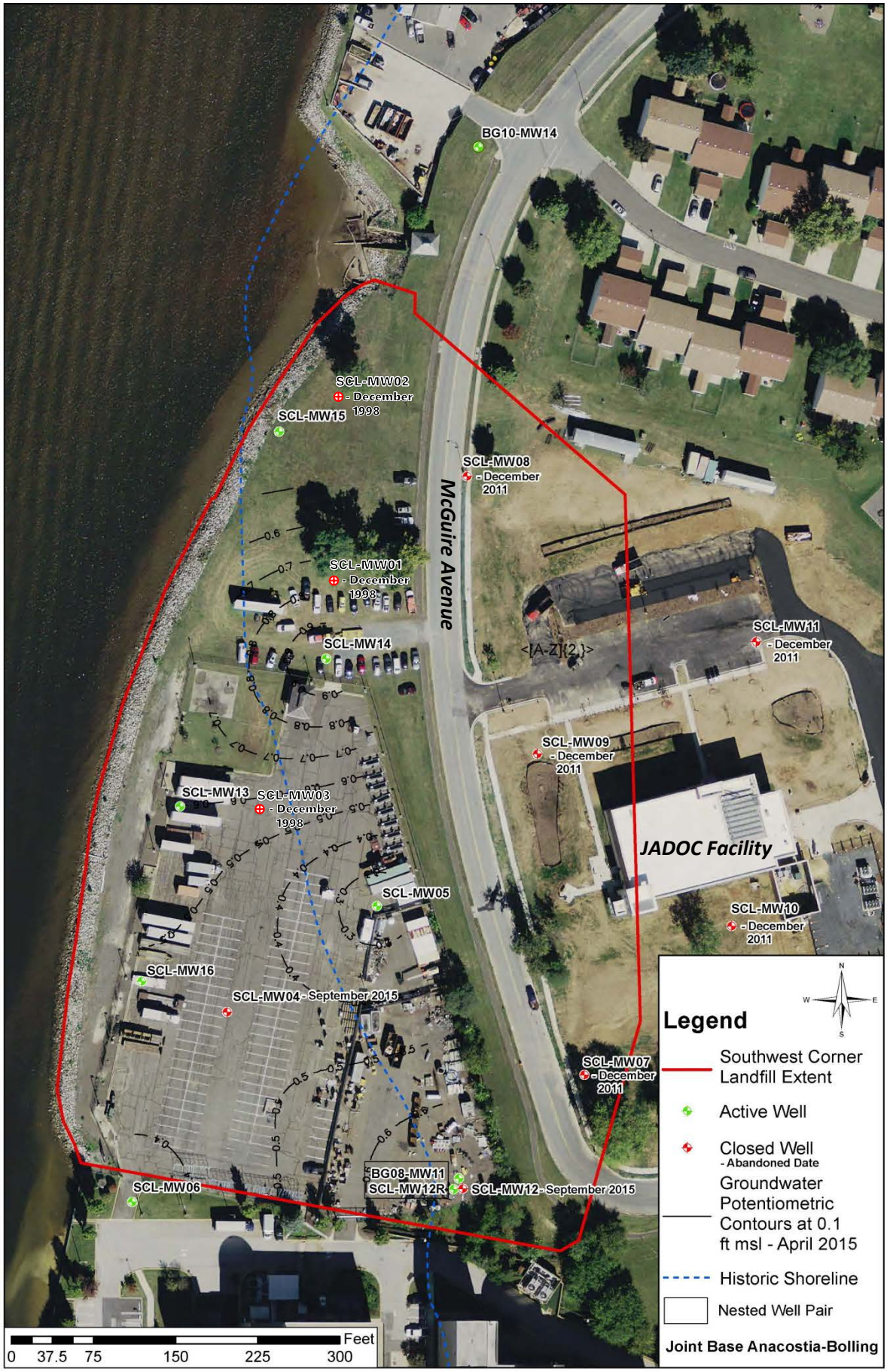
Figure 3. Site 8B/Southwest Corner Landfill LTM Well Network



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Attachment A
Community Notification Components

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JOINT BASE ANACOSTIA-BOLLING

PUBLIC ANNOUNCEMENT

Naval Facilities Engineering Command (NAVFAC) Washington announces the results of the fourth Five-Year Review to evaluate the effectiveness of the selected remedy for Site 8B/Southwest Corner Landfill at Joint Base Anacostia-Bolling (JBAB). The review focused on evaluating the implementation and performance of the selected remedy for Site 8B to determine whether the remedial measures are effective and that the response actions remain protective of public health and the environment.

A multi-disciplinary team, headed by NAVFAC Washington personnel with representatives from the District of Columbia, and various technical experts conducted the Five-Year Review. The team evaluated general site conditions, remedial actions and applicable regulations. The review started in July 2020 and ended in November 2020. The review found that current actions do protect human health and the environment. The next Five-Year Review is scheduled for November 2025.

The Five-Year Review Report is available for public inspection at the Bellevue (William O. Lockridge) Neighborhood Library, 115 Atlantic Street SW, Washington, D.C. 20032, (202) 243-1185 or at the JBAB Library, Building 4439, Tinker Street, JBAB, D.C. 20332, (202) 767-5578.

For information on the results of the review process, or other information regarding the Environmental Restoration Program at JBAB, please contact:

JBAB Public Affairs
Joint Base Anacostia-Bolling
Washington, DC 20032
(202) 284-3250
af.jbab.publicaffairs@us.af.mil

Remedial Project Manager
Department of the Navy
NAVFAC Washington
1314 Harwood Street SE, Floor 2
Washington Navy Yard, DC 20374-5051
(202) 685-3279
David.G.Collins1@navy.mil

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Attachment B
Five-Year Review Site Inspection Documentation

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RESOLUTION CONSULTANTS

NAVFAC Naval Facilities Engineering Command

Inspection of controlled area SITE 8B - SW CORNER LANDFILL ANACOSTIA_NS

Details

Controlled Area: SITE 8B - SW CORNER LANDFILL
RPMS: david.g.collins1@navy.mil
Inspector: david.g.collins1@navy.mil
Completed Date: 07/15/2020
Inspection Type: SCHEDULED
Status: CLOSED

Sites: SITE 0008B

Additional Comments: Site inspection was conducted by the JBAB Regulatory Team including Dev Murali, DOEE, Kurt VanGelder and Jack Hollingsworth, AECOM, with escort by Scott Lonesome, NRL.

Control Name	Restrictions	Last Inspected	Frequency	Inspection Status
SIGNAGE	SOIL_DISTURBANCE	06/20/2019	Annually	COMPLIANT
NOTIFICATION	OCCUPY_RESIDENTL GROUNDWATER SOIL_DISTURBANCE	06/20/2019	Annually	COMPLIANT

Checks	Input Guidance	Result	Comments
Site Security/Access			
Joint Base Anacostia-Bolling portion of SCL			
Access Road/Area			
Are there signs of recent use?	Select one	No	
Are there signs of deterioration?	Select one	No	
Is the access road passable?	Select one	Yes	
Fence			

Inspection of controlled area SITE 8B - SW CORNER LANDFILL ANACOSTIA_NS

Checks	Input Guidance	Result	Comments
Is fence in good condition?	Select one	Yes	
Are posts secure?	Select one	Yes	
Are there signs of deterioration?	Select one	No	
Remedial actions required:		None. However, one of the removable bollards at well MW16 has slight damage due to vehicle contact and will be evaluated at the next inspection for possible repairs, if warranted.	
Naval Research Laboratory portion of SCL			
Access/Entry point to parking lot			
Are there signs of deterioration?	Select one	No	
Is the access road passable?	Select one	Yes	
Fence/Gate			
Is fence/gate in good condition?	Select one	Yes	
Are posts secure?	Select one	Yes	
Does locking mechanism work?	Select one	Yes	

Inspection of controlled area SITE 8B - SW CORNER LANDFILL ANACOSTIA_NS

Checks	Input Guidance	Result	Comments
Remedial actions required:		None	
Site inspection			
Joint Base Anacostia-Bolling portion of SCL			
Vegetated cover			
Any visible signs of distressed vegetation?	Select one	No	
Any visible signs of damaged vegetation?	Select one	No	
Any areas void of vegetation?	Select one	No	
Visible causes of stressed, damaged vegetation?	Select one	No	
Remedial actions required:		None	
Erosion damage			
Are there base areas of noticeable soil washing or movement?	Select one	No	
Are there gullies or ruts?	Select one	No	
Is the rip-rap along the Potomac River in stable condition?	Select one	Yes	

Inspection of controlled area SITE 8B - SW CORNER LANDFILL ANACOSTIA_NS

Checks	Input Guidance	Result	Comments
Are there other signs of erosion damage?	Select one	No	
Remedial actions required:		None	
Settlement/Subsidence			
Are there localized low areas?	Select one	No	
Are there areas of surface water ponding?	Select one	No	
Are there areas of severe differential settlement?	Select one	No	
Remedial actions required:		None	
Naval Research Laboratory portion of SCL			
Asphalt cover			
Any visible signs of stress or settlement?	Select one	No	
Any visible signs of damaged asphalt cover?	Select one	No	
Any areas void of asphalt cover?	Select one	No	
Visible causes for stressed, damaged or uncovered areas?	Select one	No	

Inspection of controlled area SITE 8B - SW CORNER LANDFILL ANACOSTIA_NS

Checks	Input Guidance	Result	Comments
Remedial actions required:		None	
Erosion damage			
Are there base areas of noticeable failure or movement?	Select one	No	
Are there gullies or ruts?	Select one	No	
Is the rip-rap along the Potomac River in stable condition?	Select one	Yes	
Are there other signs of erosion damage?	Select one	No	
Remedial actions required:		None	
Settlement/Subsidence			
Are there localized low areas?	Select one	No	
Are there areas of surface water ponding?	Select one	No	
Are there areas of severe differential settlement?	Select one	No	

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