SOLID WASTE MANAGEMENT UNIT (SWMU) EVALUATION

FOR

U.S. ARMY GARRISON FORT BELVOIR, VIRGINIA

INDIVIDUAL VPDES INDUSTRIAL STORMWATER MAJOR PERMIT NO. VA0092771

Prepared For:

Department of the Army
U.S. Army Garrison, Fort Belvoir
Directorate of Public Works
Environmental and Natural Resources Division

Prepared By:

SES Construction and Fuel Services LLC

7217 Lockport Place, Suite 201
Lorton, VA

JUNE 2019

Table of Contents

Tables

Appendices

Acronyms and Abbreviations

AC	Administratively Closed
AFFF	Aqueous Film Forming Foams
AOC	Area of Concern
AOPC	Area of Potential Concern
AR	Army Regulation
AS/SVE	Air Sparge/ Soil Vapor Extraction System
AST	Above Ground Storage Tank
BMP	Best Management Practices
CAP	Corrective Action Plan
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CMS	Corrective Measures Study
COC	Contaminant of Concern
CWA	Clean Water Act
DAAF	Davison Army Airfield
DOD	Department of Defense
DRMO	Defense Reutilization and Marketing Office
DPE	Dual Phase Extraction System
EMS	Environmental Management System
EPG	Engineer Proving Ground
EPA	Environmental Protection Agency
ERTC	Engineer Replacement Training Center
FBNA	Fort Belvoir North Area
HWMMP	Hazardous Waste Management and Minimization Plan
IC	Institutional Control
ISW	Industrial Stormwater
LFG	Landfill Gas
LPH	Liquid Phase Hydrocarbons
LUC	Land Use Control
MCL	Maximum Contaminant Level
MMRP	Military Munitions Response Program
MNA	Monitored Natural Attenuation

MS4	Municipal Separate Storm Sewer System
NFA	No Further Action
NPDES	National Pollutant Discharge Elimination System
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated biphenyl
PCE	Tetrachloroethylene
PMP	Petroleum Management Program
POL	Petroleum, Oil, and Lubricants
RBC	Risk-Based Criteria
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
RO	Representative Outfall
ROTC	Reserve Officer Training Corps
RSL	Regional Screening Level
SVE	Soil Vapor Extraction System
SVOC	Semi Volatile Organic Compounds
SWMU	Solid Waste Management Unit
TAL	Target Analyte List
TMDL	Total Maximum Daily Load
TPH	Total Petroleum Hydrocarbon
UAO	Unilateral Administrative Order
UST	Underground Storage Tank
UU/UE	Unrestricted Use/Unlimited Exposure
VADEQ	Virginia Department of Environmental Quality
VOC	Volatile Organic Compounds
VPDES	Virginia Pollutant Discharge Elimination System
VSWMR	Virginia Solid Waste Management Regulations
WLA	Waste Load Allocation
WWI	World War I
WWII	World War II

1 INTRODUCTION

The U.S. Army Garrison Fort Belvoir is located in southeastern Fairfax County, Virginia, approximately 15 miles southwest of Washington, DC, and 95 miles north of Richmond, Virginia. Fort Belvoir's military history dates to the early 1900s, when the facility was known as Camp Belvoir and used as an Army rifle range and training camp. The post was re-named Fort Humphreys in 1922, and became Fort Belvoir in 1935. Since 1935, Fort Belvoir has supported major U.S. military operations throughout the world.

Fort Belvoir consists of Main Post and Fort Belvoir North Area (FBNA), formerly known as the Engineer Proving Ground (EPG). Fort Belvoir Main Post covers more than 7,700-acres, and FBNA is an additional 800-acre detachment parcel located on the west side of Interstate 95 as shown in Figure 1. The Main Post is situated between Interstate 95 and Pohick Bay and Gunston Cove on the Potomac River. US Route 1 divides the Main Post into two distinct geographical areas, referred to as North Post and South Post.

In recent years, Fort Belvoir has functioned primarily as an administrative and logistics support center for the Army and as a host for over 100 tenant organizations from various government branches (including all branches of the armed services). It currently employs more than 39,000 civilian and military personnel, and provides support services for over 200,000 military personnel, dependents, and retirees in the region. Development along US Route 1 consists of mixed use commercial businesses and scattered residences. The surrounding area is developed with residential and commercial/retail businesses.

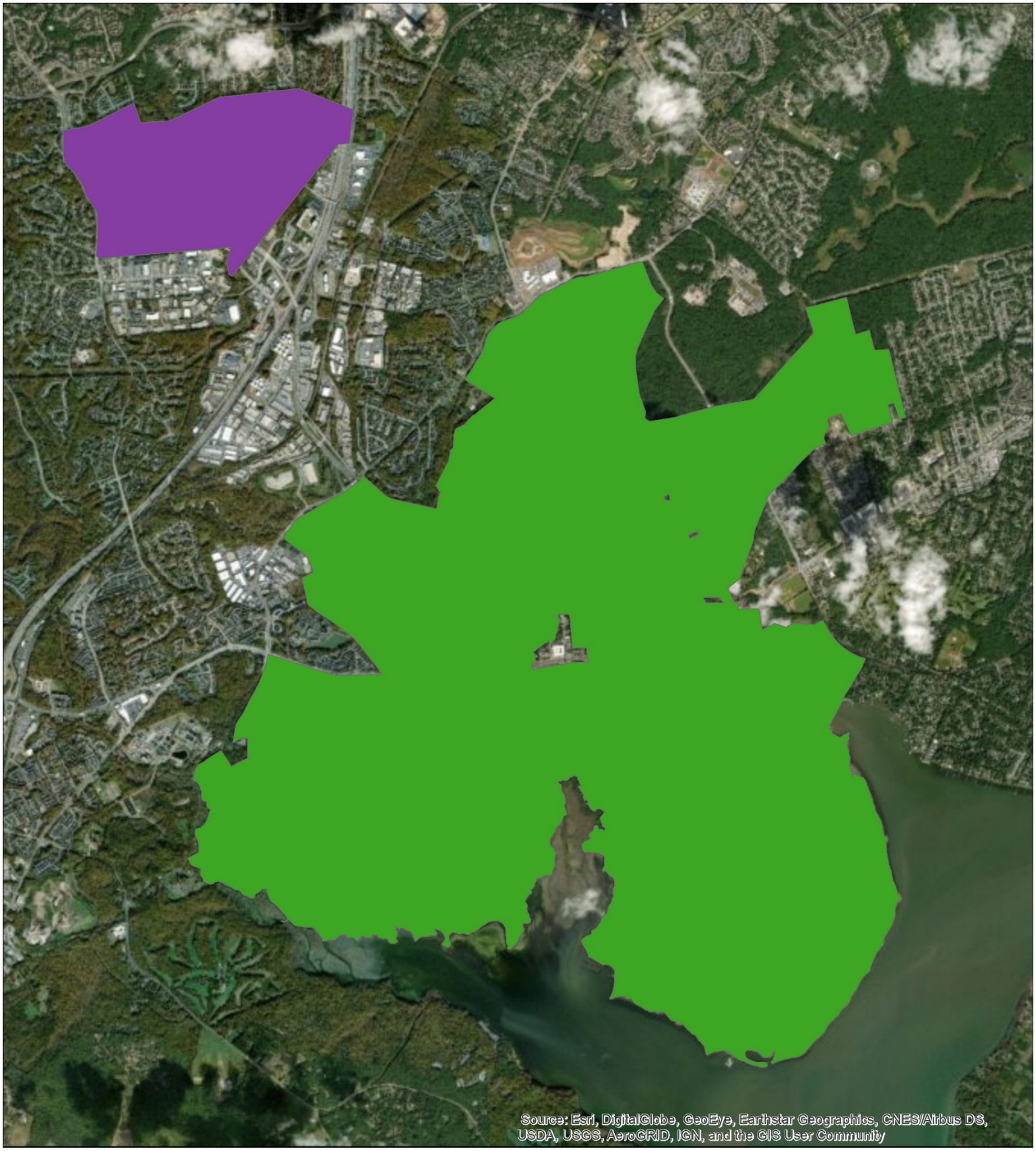
Fort Belvoir currently holds an Individual Virginia Pollutant Discharge Elimination System (VPDES) Industrial Stormwater (ISW) Major Permit No. VA0092771, issued December 9, 2016, and effective January 1, 2017. The ISW Major Permit covers industrial discharges from 31 Representative Outfalls (RO) across the installation and is administered by the Virginia Department of Environmental Quality (VADEQ) and State Water Control Board. As required under Part I.C.3 of the ISW Major Permit, Fort Belvoir conducted an evaluation of all active Solid Waste Management Units (SWMUs) as identified under Resource Conservation and Recovery Act (RCRA) regulations.

Fort Belvoir's size as well as its long and diverse history of military use have contributed to the identification of 215 SWMUs on Main Post that are currently managed under the Fort Belvoir RCRA Part B Permit for Storage and Corrective Action (EPA ID VA 7213720082) and seven location areas on FBNA that are currently managed under Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) authority.

The drainage area of each RO was evaluated to determine:

- The presence of SWMUs, both active or closed
- The location of each SWMU within the drainage area
- The type and function of each SWMU
- To the extent available, information on wastes that are/were managed or released at each SWMU.

Monitoring for the substances noted in Attachment A, *"Water Quality Criteria Monitoring"* of the permit was conducted at each RO found to have an active SWMU as required under Part I.C.3.b. Sample results were reviewed and compared to Virginia Water Quality Criteria for aquatic life in freshwater in order to determine impacts from onsite runoff. This report presents the findings of the SWMU study and discharge monitoring reports from ROs characterized as having an active SWMU as of the effective date of the permit.



Legend

- Fort Belvoir North Area
- Fort Belvoir Main Post

N

Fort Belvoir Boundaries

0 0.45 0.9 1.8 Miles

SES Construction and Fuel Services LLC

2 LEGAL AUTHORITIES

2.1 SECTION 303(D) OF THE CLEAN WATER ACT (CWA) AND THE U.S. ENVIRONMENTAL PROTECTION AGENCY'S (EPA'S) WATER QUALITY PLANNING AND MANAGEMENT REGULATIONS (40 CFR PART 130)

The Clean Water Act (CWA) is the primary federal law governing water pollution. Its objective is to restore and maintain the chemical, physical, and biological integrity of the nation's waters by preventing point and nonpoint pollution sources; recognizing the responsibilities of the states in addressing pollution and providing assistance to states to do so. It is administered by the U.S. Environmental Protection Agency (EPA), in coordination with state governments. Its implementing regulations are codified at 40 Code of Federal Regulations (CFR) Subchapters D, N, and O (Parts 100-140, 401-471, and 501-503).

2.2 US ARMY REGULATIONS (AR) 200-1, ENVIRONMENTAL PROTECTION AND ENHANCEMENT

The AR 200-1 defines the framework for the Army Environmental Management System (EMS). It implements Federal, State, and local environmental laws and Department of Defense (DOD) policies for preserving, protecting, conserving, and restoring the quality of the environment. This regulation addresses environmental responsibilities of all Army organizations and agencies. Specifically, this regulation applies to Active Army, Army National Guard, United States Army Reserve, as well as Tenants, contractors, and lessees performing functions on real property under the jurisdiction of the Department of the Army (for example, Army and Air Force Exchange Services (AAFES), Defense Commissary Agency (DECA)). (Army, 2007). Chapter 4-2 of the AR requires compliance with all requirements, substantive and procedural, for control and abatement of water pollution, as outlined in the CWA. This requires that all Army facilities will:

> *Ensure that activities required to meet other environmental legal requirements, like RCRA, that impact water quality in an impaired water or are impacted by an impaired water (for example, Chapter 35, Title 16, United States Code (16 USC Chapter 35)) are informed of CWA requirements. These non-CWA activities should be integrated into the management plan.*

In addition AR 200-1 Chapter 4-2.e. requires that a stormwater program Follow State approved plans and local permit requirements for non-point source water pollution control where applicable.

2.3 FORT BELVOIR INDIVIDUAL VPDES FOR DISCHARGES OF INDUSTRIAL STORMWATER (ISW) INDIVIDUAL MAJOR PERMIT NO. VA0092771

Special conditions of the permit under Part I.C. require that:

> *"The permittee shall provide an evaluation of all active Solid Waste Management Units (SWMU) within the drainage area of those outfalls identified in Part I.A.1 – Part I.A.32 of this permit. For purposes of this permit, an active SWMU is one that has been deemed active under Resource Conservation and Recovery Act (RCRA) regulations and is active as of the effective date of this permit"*

In addition to evaluating the drainage areas of the ROs for active SWMUs the permit requires the permittee to characterize the stormwater runoff from sites with active SWMUs. To do so the permittee shall monitor the discharge from any outfall identified as having an active SWMU within its drainage area for the substances noted in Attachment A of this VPDES permit.

"Monitoring for the substances noted in Attachment A, "Water Quality Criteria Monitoring" are to be conducted according to the indicated analysis number, quantification level, sample type and frequency."

2.4 FORT BELVOIR RCRA PART B PERMIT FOR STORAGE AND CORRECTIVE ACTION (EPA ID VA 7213720082)

The Fort Belvoir Hazardous Waste Management Permit for Storage and Corrective Action was issued by the VADEQ and became effective August 10, 2015. It authorizes Fort Belvoir to manage hazardous wastes at Building 1490 in accordance with RCRA and applicable provisions of 9VAC 20-60. Module IV of the Permit details the requirements of site wide corrective actions to be taken to protect human health and the environment from all releases of hazardous waste or constituents from any solid waste management unit (SWMU) or Areas of Concern (AOC). Module IV requires that a RCRA Facility Investigation (RFI) be conducted for any potential releases at SWMUs and/or AOCs and states that:

"The purpose of the RFI is to determine the nature and extent of potential releases from SWMUs and AOCs, to screen SWMUs and AOCs from further investigation, and to determine whether interim/stabilization measures are necessary. The RFI includes the collection of site specific data and an evaluation of potential impacts to human health and the environment from potential contamination from the facility. The RFI will gather all data necessary for the VDEQ/EPA Region 3 to determine whether a Corrective Measures Study (CMS) is required."

All SWMUs, new and old, on Fort Belvoir are managed as per Module IV of the RCRA Part B Permit. If VADEQ or EPA Region 3 determine, on the basis of the RFI or any other information, that corrective measures are necessary the procedures outlined in Section IV.G of the permit will be followed until the site receives concurrence of closure.

2.5 FORT BELVOIR GARRISON POLICY MEMORANDUM #28, ENVIRONMENTAL POLICY

Fort Belvoir's Environmental Policy was signed and took effect on June 24, 2014, the most up to date policy can be seen in Appendix A. Section 4 of this policy restates Fort Belvoir's commitment to the protection of the environment and accountability for its decisions. In support of this environmental policy, Fort Belvoir will comply with legal and other requirements applicable to the conduct of Fort Belvoir's mission while continually improving Fort Belvoir's environmental performance, including:

"Proactively manage environmental issues and act promptly and responsibly to correct incidents or conditions that endanger health, safety, or the environment."

This policy provides an avenue of enforcement for requirements set forth by AR 200-1.

2.6 FORT BELVOIR GARRISON POLICY MEMORANDUM #71, STORMWATER POLLUTION PREVENTION

An installation-wide stormwater policy was developed to address compliance with the MS4 Permit, the ISW major permit and other stormwater regulations. The policy was signed and took effect on October 31, 2016 and the most up to date policy can be seen in Appendix A. The policy outlines proper protocols for minimizing stormwater pollution during activities that directly and indirectly impact water quality of the receiving waters. Section 5 of this policy states:

"Fort Belvoir is committed to protecting water quality of waterways on and surrounding Fort Belvoir to ensure that human health, ecosystem health, and the ability to conduct recreational opportunities are not impacted by stormwater pollution"

This policy provides an avenue of enforcement for requirements set forth by Fort Belvoir's CWA permits and Fort Belvoir's Hazardous Waste Management and Minimization Plan (HWMMP).

2.7 FORT BELVOIR GARRISON POLICY MEMORANDUM #72, HAZARDOUS WASTE MANAGEMENT AND MINIMIZATION POLICY

A hazardous waste minimization program has been developed for Fort Belvoir to meet the certification requirements of Section 3002(b) of the RCRA. The Fort Belvoir Hazardous Waste Management and Minimization Plan (HWMMP) details the program requirements for hazardous waste minimization and management as per AR 200-1 Chapter 10. The HWMMP outlines proper protocols for reducing the volume and toxicity of waste generated as well as procedures for hazardous waste management including storage, handling, disposal, and training requirements.

Policy memorandum #72 was developed to address compliance with the RCRA requirements and applies to any agency, activity, company, or individual performing any and all types of hazardous waste management on Fort Belvoir. The policy was signed and took effect on August 23, 2016, and the most up to date policy can be seen in Appendix A. Section 4.b of this policy requires that:

> *All commanders and supervisors on Fort Belvoir shall ensure implementation of all requirements of the plan that are applicable to their operations."*

This policy provides an avenue of enforcement for requirements set forth by Fort Belvoir's RCRA Part B Permit and HWMMP.

All current Garrison policies can be found in full at http://www.belvoir.army.mil/Belvoir/PL/_PDF_TableofContentsPL.html.

3 FORT BELVOIR SUMMARY OF SWMU EVALUATION REQUIREMENTS

This evaluation was conducted as a requirement of Fort Belvoir's current Individual ISW Permit VA0092771, effective January 1, 2017. Table 1 below summarizes the requirements of the evaluation and provides the section of this document that addresses each specific requirement.

Table 1: Summary of SWMU Evaluation Requirements

ISW Permit Section	Requirement	Evaluation Section
Part I.C.3.a	Provide an evaluation of all active Solid Waste Management Units (SWMUs) within the drainage area of those outfalls in Part I.A.1 – Part I.A.32 of ISW permit	Sections 5.1 through 5.32 Appendix B, C, D, E
Part I.C.3.a.1	Provide an evaluation of the drainage area for each outfall to determine the presence of SWMUs, active or closed	Sections 5.1 through 5.32 Appendix E
Part I.C.3.a.2	Provide a map showing the location of each SWMU within the drainage area for each outfall	Sections 5.1 through 5.32
Part I.C.3.a.3	Provide the designation of type and function of each SWMU within the drainage area for each outfall	Sections 5.1 through 5.32 Appendix C
Part I.C.3.a.4	Provide, to the extent available, information of wastes that are/were managed at each SWMU within the drainage area for each outfall	Sections 5.1 through 5.32 Appendix C
Part I.C.3.b	Monitor the discharge from any outfall identified as having an active SWMU within its drainage area in order to characterize the runoff from active SWMUs	Sections 5.5; 5.7; 5.15; 5.26; 5.27 Appendix F
Part I.C.3.b	Use Attachment A as the reporting form to submit the data and SWMU evaluation	Appendix G

4 FORT BELVOIR'S RCRA PART B PERMIT AND SWMU STATUS EVALUATION

4.1 FORT BELVOIR MILITARY HISTORY

Military use of the Fort Belvoir property began in 1915 when the US Army Engineer School, located at Washington Barracks (now Fort McNair), began conducting summer training exercises on a 1,500-acre tract. After the start of World War I (WWI), a temporary cantonment area named Camp A.A. Humphreys was constructed on the peninsula between Accotink Creek and Dogue Creek. Facilities were built to accommodate 20,000 enlisted soldiers and officers while undergoing engineering training. During WWI, training included the Engineer Replacement and Training Camp; the Engineer Officers' Training Center; the Army Gas School, which provided gas and flamethrower operations training; and the School of Military Mining. Most training was conducted in the area south of U.S. Route 1 between Accotink Bay and Dogue Creek, although parts of the installation east of Accotink Bay were used for rifle ranges.

Camp A.A. Humphreys remained active after WWI with the Engineer School moving to the Camp from Washington Barracks in 1919. It was renamed Fort Humphreys in 1922. The Engineer School provided training in forestry, road and railroad construction, camouflage, mining, surveying, pontoon bridge construction, photography, printing, and cooking. The site also served as a summer training camp for the Reserve Officers Training Corps (ROTC). The ROTC cadets received basic training in bayonet drill, target practice, military administration and law, first aid and sanitation, bridge building, demolition, reconnaissance, and railroad construction.

In 1924, the Engineer Board—the forerunner of the Belvoir Research, Development and Engineering Center—relocated to Fort Humphreys. The Engineer Board developed many innovations, including assault boats, portable steel bridges and mine detectors. The 1920s was a period of construction during which most of the temporary WWI buildings were replaced with permanent structures. The present Main Post, as well as many of the officer and enlisted family quarters, was built at this time.

In 1935, Fort Humphreys was renamed Fort Belvoir and was expanded in the 1940s to accommodate increased activity because of the start of World War II (WWII). An additional area of 3,000 acres was acquired for a new Engineer Replacement Training Center (ERTC). The ERTC educated troops in reconnaissance, unit coordination, road and obstacle construction, and demolition. Engineering specialists were trained in carpentry, drafting, surveying, and operating construction machinery. Specialized courses were offered in weapons operation such as tanks, flamethrowers, and anti-aircraft guns. Other development included the construction of the Davison Army Airfield in the western quadrant of the North Post.

From WWII to the 1980s, the types of training offered reflected shifts in warfare technology. A close combat range was constructed and a Chemical/Biological/Radiological School was established. In the 1950s, the Engineer Research Laboratories developed and tested new techniques for electrical power generation, camouflage and deception, materiel and fuel handing methods, bridging, and mine detection. It experimented with portable copying machines, tropical fungicides, prefabricated buildings, and heavy earth-moving equipment.

In 1988 control of Fort Belvoir shifted from the US Army Training and Doctrine Command to the US Army Military District of Washington under the Installation Management Command. In recent years, Fort Belvoir has functioned primarily as an administrative and logistics support center for the Army and as a host for over 100 tenant organizations from various government branches, including all branches of the armed services. It currently employs more than 39,000 civilian and military personnel, and provides support services for over 200,000 military personnel, dependents, and retirees in the National Capital Region.

4.2 FORT BELVOIR RCRA INVESTIGATION HISTORY

A SWMU, as defined by RCRA, is any discernible place or unit at which solid or hazardous wastes have been placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous waste. Solid wastes include solids, liquids, and gases and must be discarded in order to be considered waste. As such, a SWMU can be a place or unit where wastes have been stored or routinely and systematically released.

Fort Belvoir's RCRA documentation is contained in two information repositories - the Fort Belvoir Main Post RCRA Solid Waste Management Units Information Repository and the Unilateral Administrative Order-RCRA Information Repository, which addresses FBNA. Both repositories were used to review historical investigations of the SWMUs to determine location, historical use, mitigation efforts, level of closure and status as of the effective date of the ISW Major permit.

It was found that SWMUs on Fort Belvoir are currently managed under Module IV of Fort Belvoir's Hazardous Waste Management Permit for Storage and Corrective Action, effective August 2015 and administered by VADEQ. Module IV contains *"The List of All Known SWMUs/AOPCs at Fort Belvoir"*, presented in Appendix B. According to this list, The Permit currently covers 215 previously identified SWMUs on the Main Post at differing stages of closure, investigation, or remediation.

Additionally, in September 2005 the EPA issued a Unilateral Administrative Order (UAO) requiring the Department of the Army to investigate SWMUs, Areas of Potential Concern (AOPCs), and other areas where releases containing hazardous constituents occurred at FBNA. The UAO identified 44 SWMUs, 19 AOPCs, 24 petroleum storage areas, and eight (8) 'other' sites for investigation, assessment, and characterization under RCRA. In July 2017 EPA determined that the requirements of the UAO had been satisfied and the UAO was terminated.

Most of the identified sites in the UAO received approval for no further action and the rest got bulked into seven (7) site areas which required further action. The sites included three (3) SWMUs and four (4) AOPCs. Continued studies, corrective measures, and remedial actions for these areas are being addressed under CERCLA authority. The List of SWMUs covered under the UAO and the UAO Termination Letter is presented in Appendix D.

The following sections summarize the findings of the historical SWMU Evaluation and explains the different terminology used under RCRA in reference to SMWU status and designations. The 215 SWMUs identified in the RCRA Permit and the remaining seven (7) sites requiring additional action after the UAO termination were considered in this study.

4.2.1 IDENTIFICATION OF SWMUs BY TYPE AND FUNCTION

Fort Belvoir's RCRA information repositories begin with the 1988 "Phase II RCRA Facility Assessment (RFA) of the U.S. Army Engineer Center and Fort Belvoir", prepared by A.T. Kearney. This document provides the results of a file review and visual site inspections of the entire post. This assessment resulted in the identification of 202 SWMUs across Fort Belvoir. In this report, the SWMUs were grouped according to type, with each type of SWMU assigned a letter from A through M, and each individual SWMU assigned a number. A-01 is an example of how one SWMU is identified. All 22 SWMUs with an 'M' designation were located at FBNA.

Additional identification letters were added in subsequent years when additional SWMUs were discovered. This includes the 'N' designation for 24 SWMUs discovered in 1992 based on a Solid Waste Management Unit Study by CH2M HILL of the main post, the 'AOPC' designation for 19 Areas of

Potential Concern identified at FBNA during a 2001 study by Dewberry and Davis, one SWMU designated as 'DAAF' identified at Davison Army Airfield in 2009, and 'MP' for the 10 SWMUs discovered on Main Post through various field activities starting in 2010. This portion of the study led to the identification of 222 SWMU sites currently or previously investigated under RCRA across Fort Belvoir Main Post and FBNA. The Fort Belvoir SWMU lettering system is summarized in Table 2 below.

Table 2: Fort Belvoir SWMU Nomenclature

SWMU Identification	# of Total SWMUs	Type of SWMU
A	29	Landfills and Surface Impoundments
B	23	Building Storage Units
C	12	Wash Racks
D	11	Oil/Water Separators
E	14	Waste Petroleum, Oil, and Lubricant (POL) Storage Areas
F	9	Above Ground Waste POL Tanks
G	14	Underground Waste POL Tanks
H	5	Spent Battery Storage Areas
I	5	Battery Acid Neutralization Units
J	6	Incinerators
K	5	Fire Control Training Area Units
L	47	Miscellaneous Units
N	24	"New units" identified in 1992 and later, consisting of a variety of types of SWMUs
DAAF	1	Unit located at Davison Army Airfield identified in 2009
MP	10	Units identified on Main Post (MP) in 2010 and later, consisting of a variety of types of SWMUs
M	3	Units located at FBNA requiring additional actions after UAO Closure – *Now managed under CERCLA*
AOPC	4	Area of Potential Concern at FBNA requiring additional actions after UAO Closure – *Now managed under CERCLA*
Total	**222**	**Total Number of SWMUs evaluated**

These 222 sites were considered as a baseline and each was looked at individually to determine their status and applicability to the SWMU Study required under the ISW Major Permit. As stated in Part I.C.3.a for the purpose of the Permit, an active SWMU is one that has been deemed active under RCRA regulations and is active as of the effective date of the Permit. Although the seven (7) sites located at the FBNA are now being managed under CERCLA, they were being investigated under RCRA at the time of permit issuance, therefore they were also considered in this SWMU Study. The following section details the process used to determine SWMU status for these 222 sites.

4.2.2 RCRA SWMU CORRECTIVE ACTION PROCESS

In order to determine SWMU statuses for the 222 identified sites on Fort Belvoir an understanding of the RCRA Corrective Action process was needed. In general the process focuses on results instead of a particular step by step procedure. This flexibility allows the process to be driven by site-specific conditions, evaluation of site specific data, and site specific remedial objectives. Because no one approach is going to be appropriate for all SWMUs the EPA provides elements to be considered in the evaluation of

SWMUs in order to make an informed decision for cleanup. Once a SWMU has been identified the following can occur under the RCRA process:

1. ***RCRA Facility Assessment (RFA)*** - This phase is essentially a four-stage process for:

    a. Identifying and gathering information on releases at RCRA Facilities;
    b. Evaluating solid waste management units (SWMUs) and other areas of concern for releases to all media and regulated units for releases to media other than ground water;
    c. Making preliminary determinations regarding releases of concern and the need for further actions and interim measures at the facility; and
    d. Screening from further investigation those SWMUs which do not pose a threat to human health or the environment.

    If the RFA finds that a release may exist then the corrective action process continues, otherwise the process stops. No further action under the RCRA corrective action program is required at that time, because no evidence of release(s) or of suspected release(s) were identified, these sites usually receive administrative closure (AC). The decision will be documented as a Statement of Basis, Decision Document, or permit modification as described below.

2. ***RCRA Facility Investigation (RFI)*** - The purpose of this phase is to determine the nature and extent of releases of hazardous waste or hazardous constituents to the environment as well as gather information necessary to support selection and implementation of appropriate remedies. An RFI will cover the following:

    a. Environmental Setting – Identifies the sites climate, hydrogeology, soils, surface waters, and sediment.
    b. Source Characterization – Identifies the types of wastes, characteristics of those wastes, and the areas where wastes have been placed or released.
    c. Contamination Characterization – Defines the extent, origin, direction, and rate of movement of contaminates based on analytical data
    d. Potential Receptor Identification – Identifies the human populations and environmental systems that are susceptible to contaminant exposure from the facility.
    e. Risk Assessment – Determines the impact(s) of contamination on human health and/or ecological receptors.
    f. Data Analysis – Demonstrates that a sufficient amount of data in quality and quantity has been collected to describe the nature and extent of contamination, potential threat to human health and/or the environment, and support future phases.

    Information gathered during the RFI is provided to the regulatory agency who in turn conduct a health and environmental assessment based on the results and determines the need for interim corrective measures, and/or a Corrective Measures Study. These decisions tend to be driven by Action or Screening Levels which represent contaminant- and media-specific concentrations above which further action (e.g. additional characterization, risk assessment, and or remedial action) is generally warranted. If RFI information shows that there is no human health or ecological risk associated with a site a determination of No Further Action (NFA) can be made and the process stops. The decision will be documented as a Statement of Basis, Decision Document, or permit modification as described below.

3. ***Corrective Measures Study (CMS)*** - The purpose of this phase is to develop and evaluate corrective action alternative(s) and to recommend the corrective measure(s) be taken at a facility that has been deemed as a risk. Alternatives for removal, containment, treatment, and/or other remediation of the identified contamination are looked at for their potential to meet cleanup objectives established for the site. The CMS will:

    a. Describe the current situation at a SWMU

b. Establish media (soil, groundwater, air, surface water) based cleanup objectives
c. Identifies Corrective Action alternatives and evaluates each for:
    i. Long and short-term Effectiveness
    ii. Potential for reduction in toxicity, mobility, or volume of waste
    iii. Implementability and cost
    iv. Acceptance from the community and state stakeholders

If the potential need for corrective actions are identified during the RFI phase a CMS is completed and submitted to the regulatory agency for evaluation and concurrence with the proposed actions. The alternatives are evaluated against three performance standards and must meet all three for selection. Alternatives should be able to meet media cleanup goals, control the source of the releases, and protect human health and the environment. Once a remedy is selected the regulatory agency will prepare a Statement of Basis or permit modification language incorporating the proposed remedy for the site for public comment.

4. ***Statement of Basis (SOB)/Decision Document (DD)*** – These serve as the administrative record documenting and summarizing information gathered throughout the RCRA process. The SOB/DD is designed to facilitate public participation in the remedy selection process by:

    a. Identifying the proposed remedy for Corrective Action at a site and explaining the reasons for selection of a particular remedy.
    b. Describing other alternatives that were considered during the RFI/CMS phases
    c. Soliciting public review and comment on all possible remedies considered
    d. Providing information on how the public can be involved in the selection process

    The SOB/DD describes the proposed remedies or decisions of AC or NFA, but does not actually select the remedy. Following a public comment period the regulatory agency will consider all comments received and make a final decision, selecting the remedy or determining the need to develop another option. The decision will be documented on a Response to Comments (RTC) prior to the issuance of any final permit modification as required under 40 CFR 124.17. Once the Permit is modified as per 40 CFR 270.42 the site is then officially closed or may enter the Corrective Measures Implementation phase for the remedy selected.

5. ***Corrective Measures Implementation (CMI)*** – This phase involves the implementation of the design, construction, operation, maintenance, and monitoring of the corrective remedy selected during the CMS and approved by the regulatory agency after public comment. Implementation of corrective actions require that multiple plans be developed concurrently including:

    a. Management Plan detailing the overall strategy, responsible parties, conceptual design, field activities, schedule and performance criteria for the corrective actions.
    b. Community Relations Plan detailing the methods to be used in relations with the public including distribution of information, planned meetings, and the level of involvement in this phase.
    c. Sampling and Analysis Plan that provides the techniques and protocols to be used in the collection, validation, and reporting of quantitative data for the site.
    d. Corrective action Permitting Plan identifying all federal, state, interstate, regional and local permits and approvals required for the implementation of the remedy.
    e. Corrective Measures Design and Construction Plan including specifications, operations and maintenance, cost estimates, and design phases.

    In order to complete a remedy all media cleanup standards in the permit must be met, the original source has been controlled, and/or the removal or decontamination of implemented structures has been completed. Completing a final remedy, including long-term monitoring as appropriate,

means that the facility is done with corrective action for the part of the facility addressed by the final remedy.

Numerous inspections, investigations, and studies have been conducted since 1988 to determine site conditions, historical use information, environmental conditions, and best options for corrective measures, as needed, for each SWMU. In order to determine the current status of each SWMU identified above the information repositories were used to review historic site investigations and determine if the site has received concurrence for closure from EPA and/or VADEQ.

4.2.3 SWMU STATUS DESIGNATION DETERMINATION

Under RCRA VADEQ/EPA may close a SWMU following investigation or cleanup using various remedies under different statuses including an Administrative Closure (AC) or a decision of No Further Action (NFA). An AC can occur due to a site either being addressed under another program or because there was never a release on the site. Under a NFA two levels of closure may be assigned based on the agreed upon remediation level for closure of each SWMU. Table 3 provides a summary of current SWMU status designations as well as how many were found to be within the drainage area of a Representative Outfall (RO) covered under the ISW Permit.

A SWMU that is closed under AC designation may be closed for the following reasons:

- *No Release* – The site has gone through a document review or investigation and has been determined to pose no risk to human health or the environment. The review found that there was no record of a release at the site or that the site did not meet the definition of a SWMU and therefore is not subject to RCRA.
- *Other Program* – The site is currently being addressed under a separate authority or mechanism such as the Virginia Solid Waste Management Regulations (VSWMR), Petroleum Management Program (PMP), the Military Munitions Response Program (MMRP), or the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

A SWMU that is closed under a NFA designation may be closed to the following levels:

- *Unlimited Use/Unrestricted Exposure (UU/UE)* – The site has been determined to pose no risk to human health or the environment either because investigation found that there was no release to the environment, the resulting impact was screened and showed no risk to human health and the environment and is below Residential RSL/ MCL screening levels, or it was remediated to Residential RSL/ MCL screening levels. These sites are considered to have a closure status of ‘Corrective Action Complete without Controls’.
- *Industrial Standards* – The site has been remediated to below the Industrial Regional Screening Levels (RSLs)/ Maximum Contaminant Levels (MCLs) or Risk Based Criteria (RBC) and will carry future restrictions on land use. If there are potential risks associated with certain activities at the site due to residual contamination one or more site-specific Land Use Controls (LUC) may be put in place in order to protect human health. A LUC is a non-engineered instrument such as an administrative and/or legal control that minimizes the potential for human exposure to contamination and/or protects the integrity of the industrial closure decision by limiting land or resource use. These sites are considered to have a closure status of ‘Corrective Action Complete with Controls’.

A SWMU is considered active under RCRA and for the purpose of this permit, if it still requires or is undergoing a:

- RCRA Facility Investigation (RFI) to determine the amount and extent of contamination or;
- Corrective Measures Study (CMS) in order to select a remedy or;

- Corrective Measures Implementation (CMI) of Long Term Corrective Measures selected under the CMS to monitor and/or remediate historic contamination.

Table 3: Fort Belvoir SWMU Status Designations and Quantities

Status Designation	Explanation	Total SWMUs	Within RO
	Open per RCRA Regulations *Has **Not** Received Regulatory Concurrence for Site Closure*		
Active	Requires or is undergoing investigation Requires or is undergoing corrective measures	16	7
	Closed per RCRA Regulations *Has Received Regulatory Concurrence for Site Closure*		
NFA ***Industrial***	Site meets Industrial standards and no further action is required. Site meets Industrial standards and no further action is required. Institutional controls/LUCs are required to minimize the potential for human exposure to contamination by limiting land or resource use	34	23
NFA ***UU/UE***	Investigation confirmed that there was no release to the environment or impact is below Residential RSLs/ MCLs SWMU was remediated and no longer contains contamination above Residential RSLs/ MCLs	62	38
AC ***Other Program***	Currently being addressed under a separate authority mechanism such as the VSWMR, Fort Belvoir PMP, the MMRP, or CERCLA	16	14
AC ***UU/UE***	Does not meet the definition of a SWMU No record or evidence of a release or spill	94	45
Total		**215**	**127**

Based on this research, 45 of the 127 SWMUs were determined to be AC-UU/UE and 38 were classified as NFA-UU/UE for a total of 83 SWMUs that are closed to Residential standards. Of the remaining 46 SWMUs, 14 sites were administratively closed under RCRA because they are being addressed under a separate authority or mechanism including VSWMR, PMP, MMRP, or CERCLA. Corrective Action complete with controls was the designation for the 22 sites cleaned to Industrial standards that have a LUCs in place, and 1 site was closed to Industrial standards with no LUC. The seven (7) remaining SWMUs on Fort Belvoir are considered active. This information is summarized in Table 3 above, and the specific data for each SWMU by outfall is discussed in the following sections.

5 EVALUATION BY REPRESENTATIVE OUTFALL

The following sections provide an evaluation of each outfall including a map of the drainage area showing specific SWMU locations, a table containing information and data for the associated SWMUs – both active and closed, the most recent outfall sampling data where applicable, and a discussion of findings.

Appendix C presents a summary of the full evaluation of each SWMU including number, name, description, approved land use, status, and regulatory closure date if applicable. The SWMUs are organized into 6 tables based on status as follows:

- Table C-1: SWMUs found to be active under RCRA and are undergoing corrective measures
- Table C-2: SWMUs found to be active under RCRA and require further evaluation (to include RFI) or remediation (such as interim removal, or monitored natural attenuation).
- Table C-3: SWMUs found to be closed under RCRA and EPA Region III's proposed decisions are that no further actions to remediate soil, groundwater or air contamination are necessary given that the current and anticipated land use for the sites is industrial as documented in Fort Belvoir's Master Plan. If Fort Belvoir changes land use at any of the sites in the future, the SWMUs will be re-assessed to ensure protection of human health and the environment.
- Table C-4: SWMUs found to be closed under RCRA and were determined to be more appropriately addressed under another mechanism such as another site or applicable program, such as the Virginia Solid Waste Management Regulations. For these sites, EPA Region 3's proposed decisions are that no further actions are necessary to remediate soil, groundwater or air contaminations provided that the sites are properly managed under other regulatory programs.
- Table C-5: SWMUs found to be closed under RCRA and were determined to not meet the definition of a SWMU or were found to meet unlimited use/unrestricted exposure (UU/UE) scenarios in accordance with RCRA.
- Table C-6: SWMUS and AOPCs located at Fort Belvoir North Area and addressed under RCRA due to a Unilateral Administrative Order (UAO) by the EPA which was determined to be completed in a letter dated July 27, 2017. All sites site active at the North Area are now being address under CERCLA authority.

Appendix E presents a summary of the SWMUs on a RO basis and includes information on the status, level of closure, LUCs, and residual COCs.

All information gathered was based on the Information Repository which is maintained by the Fort Belvoir Restoration Group and is available to the public at both:

Lorton Library
9520 Richmond Highway
Lorton, VA 22079-2124
703-704-6000

Kingstowne Library
6500 Landsdowne Centre
Alexandria, VA 22315-5011
703-339-4610

Appendix G presents the results of sampling at the eight (8) SWMUs determined to have an active SWMU under RCRA, CERCLA, PMP, or VSWMR. Results are presented in Attachment A, "Water Quality Criteria Monitoring" as the reporting form as required under Part I.C.3.b. The sample results are attached to the corresponding Attachment A for the Outfall.

Legend

- RO 001
- Drainage Area RO 001
- Fort Belvoir Border
- Waterway

N

0 0.0175 0.035 0.07 Miles

Representative Outfall 001

SCF Construction and Fuel Services LLC

5.1 RO-001 – DAVISON ARMY AIRFIELD

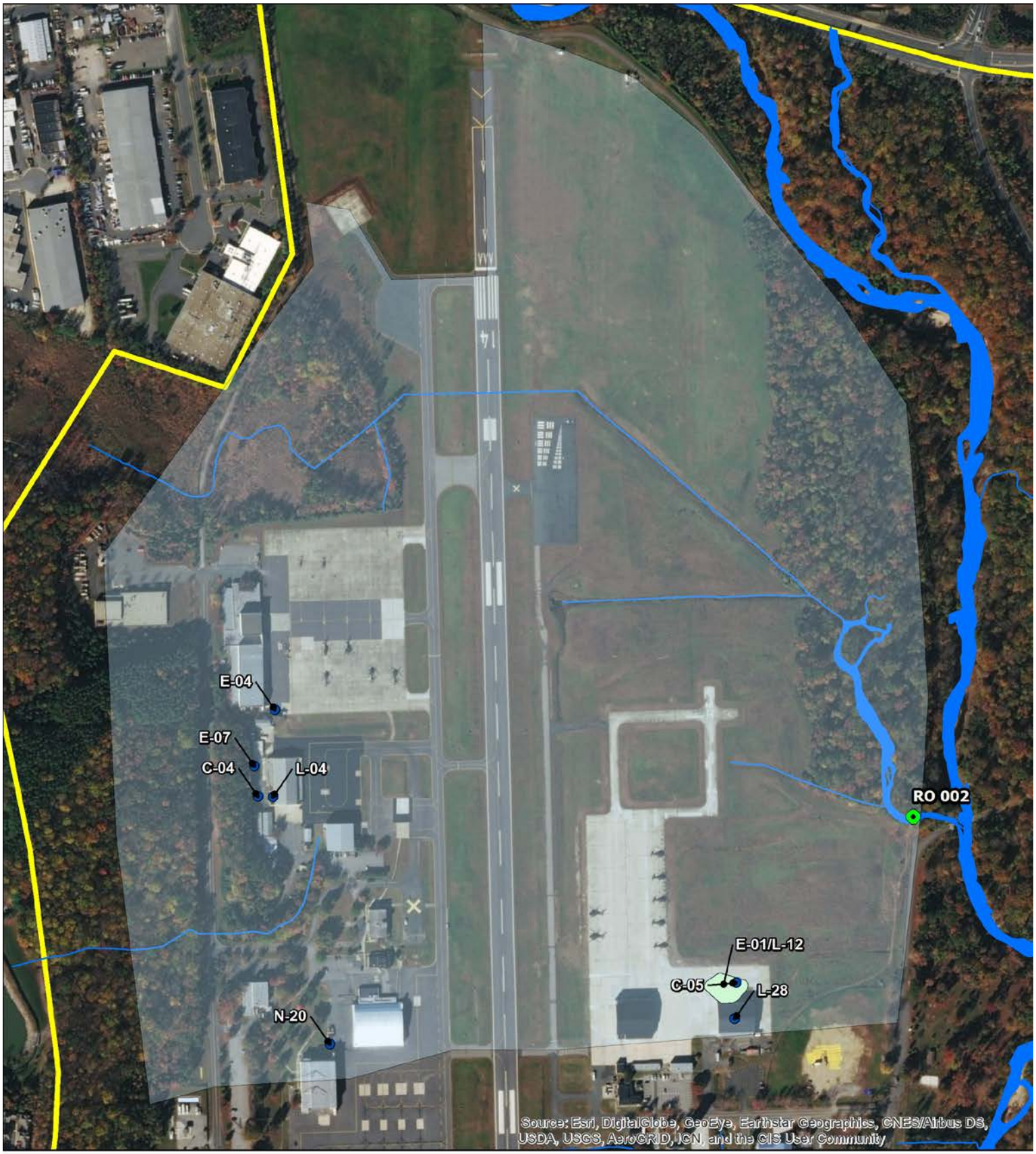
The drainage area of ISW Outfall 001 is at the northwest corner of the Davison Army Airfield (DAAF) at Ft. Belvoir. The outfall is located in a wooded area to the southwest of the intersection of Britten Drive and Santjer Road. There are no facilities or structures within the drainage area of the outfall.

The outfall receives run-off from gently sloped grassy area of land that is regularly maintained and mowed. Stormwater flows from the site in a westerly direction. Drainage ditches and a swale allow water to pass through to a culvert on Britten Drive. The drainage area for ISW Outfall 001 is within the NW portion of DAAF. It is located just north of the main airstrip. From the drainage area the water flows NE and drains into Accotink Creek.

5.1.1 RO-001 – SWMU Evaluation

As shown on the drainage map for RO-001, no SWMUs are present in this area.

Required Sampling: This evaluation indicated that Fort Belvoir is not required to characterize the stormwater runoff at Outfall RO-001 for the purposes of this permit requirement.



Legend

- RO 002
- Drainage Area RO 002
- Fort Belvoir Border
- Waterway
- SWMU Point - Status: Closed
- SWMU Area - Status: Closed

Representative Outfall 002

0 0.045 0.09 0.18 Miles

SES Construction and Fuel Services LLC

5.2 RO-002 – DAVISON ARMY AIRFIELD

The drainage area for RO-002 is located within the central portion of the Davison Army Airfield (DAAF) area at Fort Belvoir. RO-002 is located in a stream within a wooded area at the eastern portion of the drainage area where Santjer and Ehlers Roads meet. The drainage area contains Buildings 3121, 3123, 3125, 3126, 3127, 3128, 3129, 3130, 3131, 3132, 3136, 3137, 3138, 3140, 3143, 3145, 3146, 3231, and 3232.

This outfall receives runoff from multiple facilities, outdoor activities, material and waste storage, as well as runoff from airstrips and aircraft storage/maintenance areas. Most of the stormwater run-off at RO-002 is conveyed through a series of pipes and open channels that direct water in a NE direction towards an unnamed stream that drains directly into Accotink Creek.

5.2.1 RO-002 – SWMU Evaluation

As shown on the drainage map for RO-002, Nine (9) SWMUs are present within the drainage area of this outfall, eight SWMUs are closed as either AC-UU/UE or NFA-UU/UE while one received NFA but required LUCs. Environmental investigations to include soil sampling were conducted at four SWMUs. The remaining five SWMUs were administratively closed because reviews of historical records indicated that there were no documented releases or spills of hazardous materials to the environment in relation to them. These nine SWMUs are discussed below.

1. ***SWMU ID:*** C-04

   SWMU Name: Building 1338 (now bldg. 3126) Wash Rack

   Indoor/Outdoor: Outdoor

   Type, Function, and History: SWMU C-04 was identified as a wash rack at DAAF located next to Building 3126 (formerly 1338). This wash rack was operational between 1981 and 1982. Historical records for SWMU C-04 indicated that there were no documented releases or spills of hazardous materials to the environment related to this former wash rack. Therefore the site did not meet the definition of a SWMU under RCRA.

   Status: Administrative Closure (AC)

   Level of Closure: UU/UE

   Regulatory Approval: 07/06/2012

   Statement of Basis: 10/20/2014

   Residual COCs (if applicable): N/A

   LUCs (if applicable): N/A

2. ***SWMU ID:*** C-05

   SWMU Name: Building 1357 Wash Rack

   Indoor/Outdoor: Outdoor

   Type, Function, and History: SWMU C-05 was identified as an active wash rack located northwest of Building 3232 (formerly 1357). Historical records for SWMU C-05 indicated that there were no documented releases or spills of hazardous materials related to the wash rack. The wash rack consisted of a sloped concrete surface that drained into a 60ft by 4ft sediment trap, which emptied into an oil/water separator system (SWMU L-42). Therefore the site did not meet the definition of a SWMU under RCRA.

   Status: Administrative Closure (AC)

Level of Closure: UU/UE

Regulatory Approval: 07/06/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable): N/A

LUCs (if applicable): N/A

3. ***SWMU ID:*** E-01

SWMU Name: Building 1357 (now Bldg. 3232) Waste POL Storage Area

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU E-01 was identified as a waste POL storage area located on the northwest side of Building 3232. Due to their collocation, SWMU E-01 was combined with SWMU L-12 for purposes of investigation. In 2009, a Phase I investigation was performed and reported that SVOCs were detected above residential screening levels in soil. Based on this information and discussions with regulators, additional sampling was conducted and summarized in the Supplemental Environmental Investigation Report. Soil sampling conducted in May 2014 found all VOCs and SVOCs to be below RSL-Residential levels. Three metals – aluminum, cobalt, and iron - were detected above RSL-Residential levels although aluminum was detected in only one soil sample of the 22 samples taken. Arsenic was detected above both RSL-Residential and RSL-Industrial levels. However, the detected levels are typical for background levels at Fort Belvoir. This report supported a determination of No Further Action.

Status: No Further Action (NFA)

Level of Closure: UU/UE

Regulatory Approval: 09/26/2014

Statement of Basis: 10/20/2014

Residual COCs (if applicable):

> ***Soils:*** aluminum (10,400 mg/kg), arsenic (9.71 mg/kg), cobalt (11.7 mg/kg), iron (16,400 mg/kg)

LUCs (if applicable): N/A

4. ***SWMU ID:*** E-04

SWMU Name: Building 3121 (Formerly Building 1348) Waste POL Storage Area

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU E-04 was identified as a raised pad over a gravel base used for the storage of 55 gallon drums containing waste and unused materials of the southwest side of Building 3121. Historical records from SWMU E-04 indicate that there are no documented releases or spills of hazardous materials to the environment related to this unit. Additionally the storage area no longer exists. Therefore the site did not meet the definition of a SWMU under RCRA.

Status: Administrative Closure (AC)

Level of Closure: UU/UE

Regulatory Approval: 07/06/12

Statement of Basis: 10/20/2014

Residual COCs (if applicable): N/A

LUCs (if applicable): N/A

5. ***SWMU ID:*** E-07

   SWMU Name: Building 1388 Waste POL Storage Area

   Indoor/Outdoor: Outdoor

   Type, Function, and History: SWMU E-07 was identified as a waste storage area used for storage of wastes such as solvents and JP-4. Historical records from SWMU E-07 indicate that there are no documented releases or spills of hazardous materials to the environment related to this unit. Therefore the site did not meet the definition of a SWMU under RCRA.

   Status: Administrative Closure (AC)

   Level of Closure: UU/UE

   Regulatory Approval: 07/06/12

   Statement of Basis: 10/20/2014

   Residual COCs (if applicable): N/A

   LUCs (if applicable): N/A

6. ***SWMU ID:*** L-04

   SWMU Name: Building 3126 (formerly Bldg. 1338) leaking Transformers

   Indoor/Outdoor: Outdoor

   Type, Function, and History: SWMU L-04 was identified as three transformers located on concrete pads at Building 1338. Based on reports from 1988 and 1992, three leaking transformers and an associated concrete pad were located at SWMU L-04, which is outside the southwest wall of Building 3126. The fluid from the three transformers was tested in 1997 and did not contain PCBs at a regulated concentration although PCB oils were present in two of the transformers. Soil samples taken at the site in 1998 did not indicate the presence of PCBs. The transformers were taken offline in 1998, and the transformers and concrete pad were removed prior to October 2005. The site has now been redeveloped as a picnic and barbeque area and is covered with concrete, eliminating exposure to precipitation. Based on this, there was no evidence or indication that a release of hazardous materials/constituents occurred from this unit.

   Status: Administrative Closure (AC)

   Level of Closure: UU/UE

   Regulatory Approval: 07/06/12

   Statement of Basis: 10/20/2014

   Residual COCs (if applicable): N/A

   LUCs (if applicable): N/A

7. ***SWMU ID:*** L-12

   SWMU Name: Building 1357 (now Bldg 3232) Empty Drum Storage Area

   Indoor/Outdoor: Outdoor

   Type, Function, and History: SWMU L-12 was identified as an empty drum storage area located on the northwest side of Building 3232 (formerly Building 1357). Due to their collocation, SWMU L-12 was combined with SWMU E-01 for purposes of investigation. In 2009, a Phase I investigation was performed and reported that SVOCs were detected above residential screening levels in soil. Based on this information and discussions with regulators, additional sampling was conducted and summarized in the Supplemental Environmental Investigation Report. Soil

sampling conducted in May 2014 found all VOCs and SVOCs to be below RSL-Residential levels. Three metals – aluminum, cobalt, and iron - were detected above RSL-Residential levels although aluminum was detected in only one soil sample of the 22 samples taken. Arsenic was detected above both RSL-Residential and RSL-Industrial levels. However, the detected levels are typical for background levels at Fort Belvoir. This report supported a determination of No Further Action with no land use controls are required.

Status: No Further Action (NFA)

Level of Closure: UU/UE

Regulatory Approval: 09/26/2014

Statement of Basis: 10/20/2014

Residual COCs (if applicable):

Soils: arsenic (9.71 mg/kg), iron (16,400 mg/kg) in soils.

LUCs (if applicable): N/A

8. ***SWMU ID:*** L-28

SWMU Name: Building 1339 Trench Drain

Indoor/Outdoor: Indoor

Type, Function, and History: SWMU L-28 was identified as a trench drain located in Building 3232. The trench drains and oil/water separators associated with SWMU L-28 are still active. Review of available historical records indicates that no release or spill has occurred at this site. Therefore the site did not meet the definition of a SWMU under RCRA.

Status: Administrative Closure (AC)

Level of Closure: UU/UE

Regulatory Approval: 07/06/12

Statement of Basis: 10/20/2014

Residual COCs (if applicable): N/A

LUCs (if applicable): N/A

9. ***SWMU ID:*** N-20

SWMU Name: Building 1330 Waste POL Storage Area

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU N-20 was identified as an outdoor storage unit for waste POL from Building 3140 (formerly Building 1330) constructed in early 1990. A Phase I RFI was performed at SWMU N-20 in January 2013. Field activities included the collection of six (6) soil boring samples from three (3) soil borings. The soil boring locations were selected based upon the historical description and location of the former POL storage area southeast of Building 3140.

Soil samples were collected from the 0.5-2.5 feet bgs interval and from the 2.5-4.5 feet bgs interval. Soil samples were analyzed for VOCs and SVOCs. None of the detected concentrations of VOCs in the soil samples collected at SWMU N-20 exceeded their corresponding RSL or SSL values. Several SVOCs were detected in soil boring samples in concentrations exceeded their corresponding residential RSL values. In addition, n-Nitrosodimethylamine exceeded its corresponding industrial RSL value. Risk evaluation of the site data concluded that the detections were isolated and thus, not significant.

Based on the findings in the Phase I investigation, Fort Belvoir received regulatory concurrence for No Further Action at SWMU N-20 based on current and anticipated land use. In order to ensure continued compliance with this condition, Fort Belvoir will implement land use controls to address n-Nitrosodimethylamine and benzo(a)pyrene that were detected above the residential screening level.

Status: No Further Action (NFA)

Level of Closure: Industrial

Regulatory Approval: 12/17/2013

Statement of Basis: 10/20/2014

Residual COCs (if applicable):

Soils: n-Nitrosodimethylamine (63 ug/kg), benzo(a)pyrene (38 ug/kg)

LUCs (if applicable): Annual Inspection; Prohibit or otherwise manage excavation; Restrict land use so no daycare, hospital, school, or residential area is built.

Required Sampling: Based on the most recent soil sampling data, record searches, UU/UE closures, and absence of active SWMUs, this evaluation indicated that Fort Belvoir is not required to characterize the stormwater runoff at Outfall RO-002 for the substances noted in Attachment A of the permit.

Legend

- RO 003
- SWMU Point - Status: Closed
- Drainage Area RO 003
- Fort Belvoir Border
- Waterway

Representative Outfall 003

0 0.0375 0.075 0.15 Miles

SES Construction and Fuel Services LLC

5.3 RO-003 – DAVISON ARMY AIRFIELD

The drainage area for Representative Outfall 003 (RO-003) is located within the southern portion of the DAAF area of Fort Belvoir. The drainage area contains Buildings 3144, 3145, 3150, 3151, 3153, 3154, 3155, 3161, 3162, 3165, 3170, 3171, 3172, 3176, 3177, 3178, 3231, 3232, 3234, 3235, 3236, 3237, 3238, 3239, 3240, 3241, and 3242.

This outfall receives runoff from multiple facilities, outdoor activities, material and waste storage, as well as runoff from airstrips and aircraft storage/maintenance areas. Stormwater run-off is conveyed through a series of drains from the western portion of the drainage area to a channel on the eastern side of the drainage area. This channel carries run-off in a SW direction to an unnamed stream that drains directly into Accotink Creek.

5.3.1 RO-003 – SWMU Evaluation

As shown on the drainage map for RO-003, Nine (9) SWMUs are present within the drainage area of this outfall, all nine SWMUs are closed as either AC-UU/UE or NFA-UU/UE. Environmental investigations to include soil sampling were conducted at eight SWMUs and groundwater sampling was conducted at seven of these SWMUs. Six (6) of these SWMUs were within the former Fire Control Training Area where training activities were discontinued in May 1990. The remaining SWMU was administratively closed because reviews of historical records indicated that there were no documented releases or spills of hazardous materials to the environment in relation to them. These nine SWMUs are discussed below.

1. ***SWMU ID:*** D-02
   SWMU Name: Fire Control Training Area OWS
   Indoor/Outdoor: Outdoor
   Type, Function, and History: SWMU D-02 was first identified as an oil water separator that was used to treat oily water and firefighting aqueous film forming foam (AFFF). It consisted of a 12 ft x 8 ft x 6 ft deep out box with an inner oil-skimmer sump that measured 3 ft x 5 ft. Closure activities at SWMU D-02 began in 1996 with the removal the unit and adjacent contaminated soil. A statistical analysis comparison was performed between the closure samples and site background samples. Subsequently, a residential health-based risk assessment was per-formed and concluded that the site met the requirements for unrestricted closure.
   A closure report was submitted in November 1997 recommending no further action. VDEQ approved this recommendation in letters dated May 1999 for soils and September 1999 for groundwater.
   Status: No Further Action (NFA)
   Level of Closure: UU/UE
   Regulatory Approval: 09/21/2012
   Statement of Basis: 10/20/2014
   Residual COCs (if applicable): N/A
   LUCs (if applicable): N/A

2. ***SWMU ID:*** DAAF-1
   SWMU Name: Davison Army Airfield – 1 Flight Tower
   Indoor/Outdoor: Outdoor

Type, Function, and History: During construction activities for a new flight tower at Davison Army Airfield, evidence of contamination (naphthalene odor) was found about 20 ft below ground surface (bgs) at one of the five boring locations. In order to determine whether there was indeed soil/groundwater contamination, Fort Belvoir advanced three soil borings and installed three temporary monitoring wells to collect samples. Samples were analyzed for VOCs and SVOCs. Sample analysis results did not indicate the presence of contamination at this site; therefore, No Further Action was recommended for the site.

Status: No Further Action (NFA)

Level of Closure: UU/UE

Regulatory Approval: 03/17/2014

Statement of Basis: 10/20/2014

Residual COCs (if applicable):

Groundwater: Arsenic (3.1 mg/kg) in soils; Manganese (1240 ug/L)

LUCs (if applicable): N/A

3. ***SWMU ID:*** E-12

SWMU Name: Waste POL Storage Area

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU E-12 was identified as a unit that managed and stored waste solvent, paints, and waste POLs in 55-gallon drums located northeast of Building 3151 (Formerly Building 1339). The unit was removed from service prior to a 2005 study of the area. A Phase I RFI was performed at SWMU E-12 in January 2013 to determine whether previous use of the area had impacted soils. Field activities included the collection of six (6) soil boring samples from three (3) soil borings. Soil samples were analyzed for VOCs and SVOCs. None of the detected VOC concentrations exceeded their corresponding residential or industrial RSL levels. In addition, none of the detected SVOC concentrations exceeded their corresponding RSLs or SSLs. Risk at the site was assessed and determined that the residual contamination were non-significant and posed no risk to human health or the environment.

Status: No Further Action (NFA)

Level of Closure: UU/UE

Regulatory Approval: 12/17/2013

Statement of Basis: 10/20/2014

Residual COCs (if applicable):

Soils: Bromomethane (6.9 ug/kg), Chloroform (3.8 ug/kg)

LUCs (if applicable): N/A

4. ***SWMU ID:*** K-01

SWMU Name: Fire Control Training Drainage Ditch

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU K-01 was identified as a shallow drainage ditch approximately 50 feet long that extended from the discharge pipe of an Oil/Water Separator (SWMU D-02) to an unnamed stream. The unit was part of the Fire Control Training Area (SWMU K-03) located at Davison Army Airfield (DAAF) Closure activities at SWMU K-01 were initiated in 1996.

Initial soil sampling indicated potential risk concerns; therefore, the remediation contractor excavated the trench to a depth of 6-feet deep by 78-feet long and 8-feet wide. Final closure samples were collected from the bottom of the trench. A health-based risk assessment was performed and concluded that the site met the requirements for unrestricted closure.

A Closure Report was prepared that concluded that the soil and groundwater was not impacted by site activities. The closure report was submitted to VDEQ in November 1997 that recommended no further action. VDEQ approved this recommendation in a letter dated May 21, 1999 for site soils and September 30, 1999 for site groundwater.

Status: No Further Action (NFA)

Level of Closure: UU/UE

Regulatory Approval: 09/21/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable): N/A

LUCs (if applicable): N/A

5. ***SWMU ID:*** K-02

   SWMU Name: Sludge Pile

   Indoor/Outdoor: Outdoor

   Type, Function, and History: SWMU K-02 was identified as a pile of sludge/debris scraped from the Fire Control Training Area (SWMU K-03) and piled on the ground in the northeast quadrant of the unit. Closure activities at SWMU K-02 were initiated in 1996 through 1997 at which time soil samples were collected and impacted soil was removed as part of the closure and associated remediation of the Fire Control Training Area Burn Pit.

   A Closure Report was prepared that concluded that the soil and groundwater was not impacted by site activities. The closure report was submitted to VDEQ in November 1997 that recommended no further action. VDEQ approved this recommendation in a letter dated May 21, 1999 for site soils and September 30, 1999 for site groundwater.

   Status: No Further Action (NFA)

   Level of Closure: UU/UE

   Regulatory Approval: 09/21/2012

   Statement of Basis: 10/20/2014

   Residual COCs (if applicable): N/A

   LUCs (if applicable): N/A

6. ***SWMU ID:*** K-03

   SWMU Name: Fire Control Training Area Pit

   Indoor/Outdoor: Outdoor

   Type, Function, and History: SWMU K-03 was identified as the Fire Control Training Area Pit located in northern portion of DAAF that became operational in 1983. Closure activities at SWMU K-03 were initiated in 1996. The training area consisted of an above-ground storage tank, burn pit (K-05), an oil/water separator (D-02), an outfall trench (K-01), an underground storage tank (K-04), and three piping systems that connected the various noted components. All these sites were remediated as a part of the same action. The remediation contractor decontaminated, characterized, and disposed of all components as appropriate, and collected four background and

closure samples. Subsequently, a residential health-based risk assessment was performed and concluded that the site did not pose an unacceptable risk.

A Closure Report was prepared that concluded that the soil and groundwater was not impacted by site activities. The closure report was submitted to VDEQ in November 1997 that recommended no further action. VDEQ approved this recommendation in a letter dated May 21, 1999 for site soils and September 30, 1999 for site groundwater.

Status: No Further Action (NFA)

Level of Closure: UU/UE

Regulatory Approval: 09/21/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable): N/A

LUCs (if applicable): N/A

7. ***SWMU ID:*** K-04

   SWMU Name: Fire Control Training Underground Storage Tank (UST)

   Indoor/Outdoor: Outdoor

   Type, Function, and History: SWMU K-04 was identified as a 500 gallon metal UST that managed waste oil that was collected from an OWS separator (D-02), which was associated with the fire control training area (K-03) located in the northern portion of DAAF. Closure activities at SWMU K-04 were initiated in 1996 at which time remediation involved the removal and disposal of the tank contents and tank as hazardous waste. Additionally, 74 cubic yards of soil and the piping between the UST and AST was also removed along with the excavated soil from the trench.

   Final closure samples were collected from the bottom of the trench and tank pit. A statistical comparison was performed between the closure samples and site background samples. In addition, a health-based risk assessment was performed and concluded that the site met the requirements for un-restricted closure.

   A closure report was submitted to VDEQ in November 1997 that recommended no further action. VDEQ approved this recommendation in a letter dated May 21, 1999 for site soils and September 30, 1999 for site groundwater.

   Status: No Further Action (NFA)

   Level of Closure: UU/UE

   Regulatory Approval: 09/21/2012

   Statement of Basis: 10/20/2014

   Residual COCs (if applicable): N/A

   LUCs (if applicable): N/A

8. ***SWMU ID:*** K-05

   SWMU Name: Fire Control Training Open Burn Area

   Indoor/Outdoor: Outdoor

   Type, Function, and History: SWMU K-05 was identified as an open burn pit that measured 15 feet in diameter that was used to burn classified waste. Closure activities at SWMU K-05 were initiated in 1996 when soil and groundwater samples were collected at and nearby sites and

impacted soil was removed as part of the closure and associated remediation of the Fire Control Training Area Burn Pit (K-03).

A closure report was submitted to VDEQ in November 1997, recommending no further action. VDEQ approved this recommendation in a letter dated May 21, 1999 for site soils and September 30, 1999 for site groundwater.

Status: No Further Action (NFA)

Level of Closure: UU/UE

Regulatory Approval: 09/21/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable): N/A

LUCs (if applicable): N/A

9. ***SWMU ID:*** L-27

   SWMU Name: Building 1339 (now bldg. 3151) Trench Drains

   Indoor/Outdoor: Outdoor

   Type, Function, and History: SWMU L-27 was identified as a system of two trench drains located within aircraft hangar Building 3151. The trench drains and oil/water separators associated with SWMU L-27 are still active. Review of available historical records indicates that no release or spill has occurred at this site. Therefore the site did not meet the definition of a SWMU under RCRA.

   Status: Administrative Closure (AC)

   Level of Closure: UU/UE

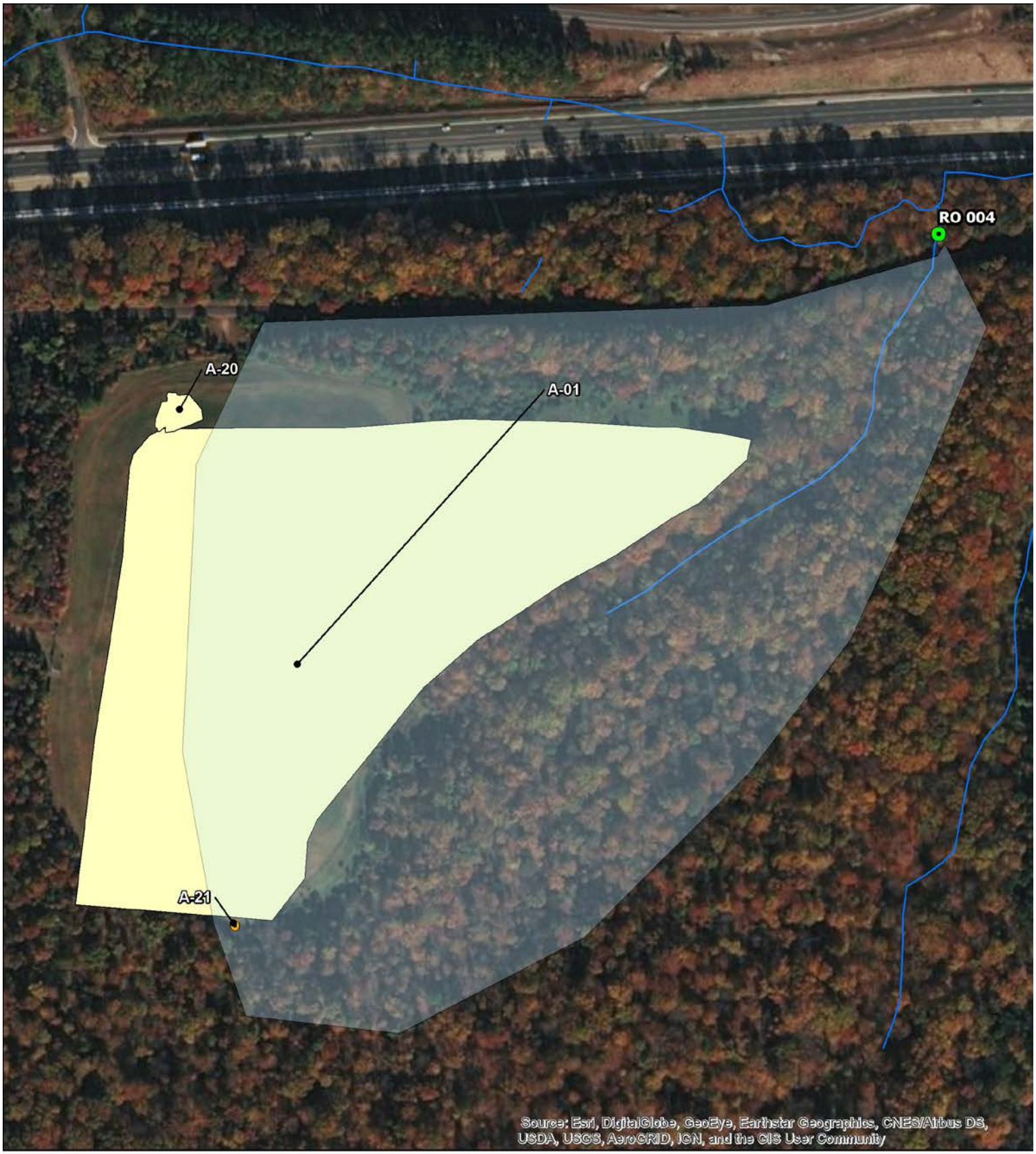
   Regulatory Approval: 07/06/2012

   Statement of Basis: 10/20/2014

   Residual COCs (if applicable): N/A

   LUCs (if applicable): N/A

Required Sampling: Based on the results of the extensive soil and groundwater sampling data from investigation of these SWMUs, the removal and proper disposal of 1,500 cubic yards of impacted soil, closure to UU/UE standards, and the absence of active SWMUs, this evaluation indicated that Fort Belvoir is not required to characterize the stormwater runoff at Outfall RO-003 for the substances noted in Attachment A of the permit.



Legend

- RO 004
- Drainage Area RO 004
- Waterway
- SWMU Area - Status: VSMWR
- SWMU Area - Status: VSWMR

N

0 0.0225 0.045 0.09 Miles

Representative Outfall 004

SES Construction and Fuel Services LLC

5.4 RO-004 – CULLUM WOODS LANDFILL

The drainage area for ISW Outfall 004 encompasses part of a closed 43 acre landfill (Cullum Woods) within a wooded area just outside the Accotink Bay Wildlife refuge, with limited access granted through two security gates. The first gate provides access to Poe road and the second provides direct access to the landfill off of Stewart Road. The Cullum Woods Landfill is a grass-covered area, rising about 35 feet from the base. The area is surrounded by woods. A small unnamed tributary, originating from the landfill and crossing Poe Road receives stormwater from the site. The tributary flows through RO-004 before continuing north towards Richmond Highway and then east towards Accotink Creek.

Landfill operations began between 1977 and 1979 and the site operated under a Virginia Solid Waste Permit No. 308 from October 2, 1980, to April 6, 1992 and received only domestic and administrative refuse. A closure plan was created in 1990 and later updated in 1993 to meet new requirements. The site stopped receiving waste on April 6, 1992 and certified closure activities, as per the plan, began in 1992 when the landfill was covered with 12 inches of top soil and seeded, four groundwater monitoring wells were installed. Construction of the final cover system began in the spring of 1993 and was completed on September 18, 1995. VADEQ inspected the landfill as part of the closure approval process and granted approval of the final closure in May 1996, contingent on successfully completing all post-closure monitoring and inspection activities for the landfill.

The landfill then started the initial 10 year post-closure activities as dictated in 9 VAC 20-81-170, scheduled to be completed by July 2004. In 2000, a passive methane mitigation system was installed. In 2001, a Corrective Measures Assessment was conducted as required by 9 VAC 20-80-130 and recommended no further action with long term monitoring. The passive system was replaced in 2001 with an active system, and now a landfill gas (LFG) blower is located near the entrance to the landfill's security gate. Landfill gas is collected through several vertical extraction wells drilled into the surface of the landfill. The vacuum pumps are used to collect and release methane and other gases from under the landfill cap.

Cullum Woods Sanitary Landfill is currently in the post-closure care period with maintenance and monitoring being conducted as required by 9 VAC 20-81. The permit was modified in 2013 to include a Corrective Action Plan (CAP), a Landfill Gas Management Plan (LGMP), Corrective Action Monitoring Plan (CAMP), and a Surface Water Monitoring Plan. This includes monitoring of groundwater for a period of ten years, to demonstrate that the landfill does not pose a risk to human health or the environment and operation of the active landfill gas collection and control system until such time that methane generation rates are demonstrated to have abated sufficiently to preclude the presence of methane above regulatory limits at the facility boundary.

Although this site is currently permitted under Sector L in the ISW Permit it does not meet the definition of an active landfill. Industrial sector fact sheets and associated regulations are provided in Appendix H. Per 9 VAC 25-151-190, ISW permits:

> *"Do not cover discharges from landfills that receive only municipal wastes, Landfills (including landfills in "post-closure care") that have been properly closed and capped in accordance with 9 VAC 20-81-160 and 9 VAC 20-81-170 and have no significant materials exposed to stormwater."*

Because the Cullum Woods Landfill stopped receiving waste in 1992 and was closed and capped as required under 9 VAC 25-81 The site is essentially being permitted under both Solid Waste and Stormwater regulations. It is recommended that this landfill be removed from the next cycle of the ISW permit and that post closure monitoring under the Solid Waste Program continues until its requirements are met. The drainage area for RO-004 was still evaluated for SWMUs as required under the current permit and can be seen below.

5.4.1 RO-004 – SWMU Evaluation

As shown on the drainage map for RO-004, Three (3) SWMUs are present within the drainage area of this outfall, all three are administratively closed under RCRA as they are being managed under Post Closure Care through Fort Belvoir's Solid Waste Program in accordance with Solid Waste Permit (SWP) 308 and 9 VAC 20-81. These three SWMUs are discussed below.

1. ***SWMU ID:*** A-01

   SWMU Name: Cullum Woods Landfill

   Indoor/Outdoor: Outdoor

   Type, Function, and History: Site A-01 was identified as a 43-acre closed unlined landfill known as Cullum Woods Landfill. The landfill stopped receiving waste on April 6, 1992. SWMU A-01, Cullum Woods Landfill is managed under Post Closure Care through Fort Belvoir's Solid Waste Program in accordance with Virginia Solid Waste Management Regulations (VSWMR). A perimeter gas monitoring network of six (6) wells is installed in accordance with VSWMR requirements which are sampled quarterly. 15 groundwater monitoring wells are sampled semi-annually in accordance with the Solid Waste Permit. In addition semi-annual inspections of the landfill cap are done to ensure the cap in integrity. Inspections of the landfill and its operations were completed by VADEQ in 2016, 2017, 2018, and 2019 which documented that there were no deficiencies found. As this site is being properly managed under these regulations, A-01 received regulatory concurrence from US EPA Region 3 for closure under RCRA.

   Status: Administrative Closure (AC)

   Level of Closure: Managed under VSWMR (SWP #308)

   Regulatory Approval: 07/06/2012

   Statement of Basis: 10/20/2014

   Residual COCs (if applicable):

   Groundwater: 1,1-dichloroethane (4.7 ug/L), Cobalt (11.3 ug/L), vinyl chloride (3.3 ug/L)

   LUCs (if applicable): N/A

2. ***SWMU ID:*** A-20

   SWMU Name: Cullum Woods Landfill Catchment Pond

   Indoor/Outdoor: Outdoor

   Type, Function, and History: SWMU A-20 was identified as a detention basin located adjacent to the north-western corner of the. A joint decision was made in 1979 by the USACE, Baltimore District, USACE Waterways Experiment Station, the Virginia State Water Control Board (now the DEQ) and the Virginia Department of Health to construct a detention basin (A-20) adjacent to the northwestern corner of the Cullum Woods Municipal Landfill (A-01) into which the rainwater collecting in the landfill trenches could be pumped and held temporarily. Because SWMU A-20 was constructed in association with the landfill which is being properly managed in post-closure care, under VSWMP regulations it received regulatory concurrence from US EPA Region 3 for closure under RCRA.

   Status: Administrative Closure (AC)

   Level of Closure: Managed under VSWMR (SWP #308)

   Regulatory Approval: 07/06/2012

   Statement of Basis: 10/20/2014

   Residual COCs (if applicable): N/A

   LUCs (if applicable): N/A

3. ***SWMU ID:*** A-21

   SWMU Name: Cullum Woods Landfill Spray Irrigation System

   Indoor/Outdoor: Outdoor

   Type, Function, and History: SWMU A-21 was identified as an irrigation system that was used to discharge water from the detention pond (SWMU A- 20) associated with the Cullum Woods Municipal Landfill (SWMU A-01). Cullum Woods Landfill (SWMU A-01) is managed under Post Closure Care through Fort Belvoir's Solid Waste Program in accordance with Virginia Solid Waste Management Regulations. As SWMU A-21 is associated with SWMU A-01, this unit is being properly managed under these regulations. Therefore, SWMU A-21 received regulatory concurrence from US EPA Region 3 for Administrative Closure

   Status: Administrative Closure (AC)

   Level of Closure: Managed under VSWMR (SWP #308)

   Regulatory Approval: 07/06/2012

   Statement of Basis: 10/20/2014

   Residual COCs (if applicable): N/A

   LUCs (if applicable): N/A

Required Sampling: Based on the evaluation no active SWMUs, as defined in Part I.C.3.a, were located within the drainage area because the sites are managed under the VSWMR and not RCRA. Therefore no stormwater runoff characterization was not required for RO-004. Fort Belvoir determined that characterizing the discharge would still be beneficial information since the site is still actively being monitored until natural attenuation is achieved and may be influencing samples taken semi-annually as per Part I.A.4 of the permit.

5.4.2 RO-004 – SWMU Sample Analysis

A sample was collected at RO-004 on December 1, 2018 for the substances noted in Attachment A, "Water Quality Criteria Monitoring". The sample results for constituents detected above the specified Quantification Level (QL) are summarized in Table 4 below. All exceedances of Water Quality Criteria is highlighted in red. The completed Attachment A and laboratory results are provided in Appendix G-1.

These results were compared to the Virginia Water Quality Criteria (WQC) for surface waters as listed in 9VAC25-260-140. The Freshwater Acute WQC for cadmium, chromium III, copper, lead, nickel, silver, and zinc are a function of total hardness as calcium carbonate (CaCO3) mg/L and the Water Effect Ratio (WER). Attachment A does not require reporting of hardness and therefore this information was not collected. Due to hardness not being collected with this round of sampling, the minimum or conservative value of 25 mg/L, The maximum of 100 mg/L, the median of 50 mg/L that was used in the waste load allocation analysis completed by VADEQ in 2015, and the historical average of 26.3 mg/L was used for hardness values, while the WER was assumed to be ‘1’. Criteria values for the conservative, median, maximum, and average criteria are presented below for comparison. Calculation of WQC for each metal dependent on hardness are presented in Appendix F.

Acute Freshwater and Human Health WQC was not exceeded for any of the detected metals. Although low levels of copper, nickel, and zinc were detected, no other analyte listed in Attachment A was detected in samples.

Table 4: RO-004 Sample Result Summary

Analytes (Dissolved)	Freshwater Acute Criteria (ug/L)[1]				Human Health (ug/L)	Sample Result (ug/L)
	Conservative[2]	Average[3]	Median[4]	Maximum[5]		
Copper	3.64	3.82	6.99	13.44	–	***1.57***
Nickel	56.44	58.97	101.45	182.36	4600	***1.57***
Zinc	36.20	37.50	65.13	117.18	26000	***12.3***

[1] WQC for cadmium, chromium III, copper, lead, nickel, silver, and zinc are a function of total hardness as calcium carbonate (CaCO3) mg/L and the Water Effect Ratio (WER).
[2]WQC calculated based on a conservative or minimum hardness value of 25 mg/L as defined in 9 VAC 25-260-140.
[3] WQC calculated based on the average hardness from historical sampling in 2017 and 2018 at RO-004.
[4] WQC calculated based on the hardness value of 50 mg/L used by VADEQ in 2015 when running a Wasteload Allocation Analysis in April 2015 based on OWP Guidance Memorandum 00-2011.
[5] WQC calculated based on a maximum hardness value of 100 mg/L as defined in 9 VAC 25-260-140.
Bold sample result indicates exceedance of one or more Water Quality Criteria.
Bold WQC that was exceeded based on results

Legend

- RO 005
- Drainage Area RO 005
- Waterway
- SWMU Point - Status: Active

N

Representative Outfall 005

0 0.00750.015 0.03 Miles

SES Construction and Fuel Services LLC

5.5 RO-005 – BUILDING 1495

The drainage area for Outfall 005 includes Building 1495, a less than 90 days Hazardous Waste Storage Facility. A paved parking area serviced by a paved access road exists on the east side of the building. Loading and unloading of vehicles containing hazardous waste occurs on a paved area on the north side of Building 1495. On the western side of the building, eight (8) hazardous waste storage units are present on a raised and grounded concrete pad. An additional two storage units are used for spill response supplies and equipment.

The entire facility is fenced and access is only permitted by a combination key code provided only to facility personnel authorized for entry or by appointment with the facility manager. Outfall 005 is located in a grass swale southwest of the facility outside of the fenced area and drains into a wetland. In general surface flows from the facility are to the southwest and ultimately discharge to Accotink Creek.

5.5.1 RO-005 – SWMU Evaluation

As shown on the drainage map for RO-005, two (2) SWMUs are present within the drainage area of this outfall. One of the SWMUs is closed as NFA-UU/UE and the other is being actively investigated. Environmental investigations to include soil sampling were conducted at both SWMUs and groundwater sampling was conducted at N-10 and is planned for MP-11. These three SWMUs are discussed below.

1. ***SWMU ID:*** MP-11

   SWMU Name: Former PCB Transformer Storage Area (Bldg. 1495)

   Indoor/Outdoor: Outdoor

   Type, Function, and History: The PCB site at Building 1495 consists of the northeast corner of the adjacent parking lot as presented in Figure 10. PCB containing transformers were stored in the area between 2010 and 2012 and were exposed to precipitation. In 2012, ENRD received reports of fluid leaking from the transformers. The transformers were relocated inside Hazardous Waste Disposal Building (Building 1495) and later properly removed and disposed of. Upon the relocation of the transformers to the building, Stains are visible on the asphalt at the site and absorbent and containment materials were placed around the affected areas. Sampling was conducted in April and August of 2012 and Aroclor 1260 was detected in 2 of the 4 soil and asphalt samples.

   Stained soils and odor were encountered while performing construction activities as part of the adjacent Building 1495 remodeling project in August 2013. Soil samples taken on the 12th, 13th, and 27th of August 2013 indicated elevated levels of TPH and PCBs. Work was stopped until the contractor sampled and submitted a Site Safety and Health Plan (SSHP), samples taken on June 23rd 2014 were non-detect for PCBs. On July 7th 2014, once the SSHP was approved, soil was removed from the affected location. Confirmation soil samples were taken in the areas on July 9th 2014 which also indicated no residual PCB contamination in the area where the work was being done.

   As part of the Building 1495 remodeling project additional soil removal was conducted in the northeastern portion of the parking lot and the lot was re-asphalted. Soil sample taken on October 27th 2014 was non-detect for PCBs. Eight (8) Soil and three (3) surface water samples were taken on June 22nd 2015 at locations in the vicinity of the former PCB transformer storage area and adjacent to Building 1495 in order to assess impacts to soil. Results of this sampling indicated the presence of PCBs in one surface soil sample located in the northeastern eastern portion of the lot in the grass area.

   Additionally, MP-11 is also included in the 2018 Fort Belvoir PCB TMDL Action Plan developed to meet Part I.C.4 of the ISW Permit. The plan recommends continued annual

monitoring to confirm the downward trend in PCB detection toward meeting water quality criteria for PCBs (640 pg/L).

Status: RCRA Facility Investigation (RFI)

Level of Closure: **Active**

Regulatory Approval: N/A

Statement of Basis: N/A

Residual COCs (if applicable): Site is currently being investigated

LUCs (if applicable): N/A

2. ***SWMU ID:*** N-10

   SWMU Name: Building 1495 Waste POL UST

   Indoor/Outdoor: Outdoor

   Type, Function, and History: SWMU N-10 was identified as two 1,000 gallons USTs used for the storage of waste oil from electricity generators at Building 1495. Both USTs have been removed from service and excavated in January 1993. Soil and groundwater sampling was conducted at that time. No analytes were detected above RSL Residential levels for soil, and no analytes were detected above the groundwater MCL. The Site Characterization Report was completed in September 1993. Fort Belvoir recommended No Further Action for the site. This SWMU was approved for NFA UU/UE in 1994.

   Status: No Further Action (NFA)

   Level of Closure: UU/UE

   Regulatory Approval: 09/21/2012

   Statement of Basis: 10/20/2014

   Residual COCs (if applicable): N/A

   LUCs (if applicable): N/A

Required Sampling: Based on the presence of an active SWMU, as defined in Part I.C.3.a, this evaluation determined that it is necessary for Fort Belvoir to monitor and characterize the discharge from RO-005. The results are discussed below.

5.5.2 RO-005 – SWMU Sample Analysis

A sample was collected at RO-005 on April 24, 2018 for the substances noted in Attachment A, "Water Quality Criteria Monitoring". The sample results for constituents detected above the specified Quantification Level (QL) are summarized in Table 5 below. All exceedances of Water Quality Criteria is highlighted in red. The completed Attachment A and laboratory results are provided in Appendix G-2.

These results were compared to the Virginia Water Quality Criteria (WQC) for surface waters as listed in 9VAC25-260-140. The Freshwater Acute WQC for copper, nickel, and zinc are a function of total hardness as calcium carbonate (CaCO3) mg/L and the Water Effect Ratio (WER). Attachment A does not require reporting of hardness and therefore this information was not collected. Due to hardness not being collected with this round of sampling, the minimum or conservative value of 25 mg/L, The maximum of 100 mg/L, the median of 50 mg/L that was used in the waste load allocation analysis completed by VADEQ in 2015, and the historical average of 66.5 mg/L was used for hardness values, while the WER was assumed to be ‘1’. Criteria values for the conservative, median, maximum, and average criteria are presented below for comparison. Calculation of WQC for each metal dependent on hardness are presented in Appendix F.

Acute Freshwater WQC was exceeded for zinc for all hardness levels except the maximum that is not characteristic for Fort Belvoir. Although the WQC was exceeded for zinc and low levels of copper and nickel were detected in samples, no other analyte listed in Attachment A was detected in samples.

Table 5: RO-005 Sample Result Summary

Analytes (Dissolved)	Freshwater Acute Criteria (ug/L)[1]				Human Health (ug/L)	Sample Result (ug/L)
	Conservative[2]	Average[3]	Median[4]	Maximum[5]		
Copper	3.64	9.15	6.99	13.44	–	**1.31**
Nickel	56.44	129.13	101.45	182.36	4600	**15.4**
Zinc	***36.20***	***82.93***	***65.13***	117.18	26000	***84.1***

[1] WQC for cadmium, chromium III, copper, lead, nickel, silver, and zinc are a function of total hardness as calcium carbonate (CaCO3) mg/L and the Water Effect Ratio (WER).
[2]WQC calculated based on a conservative or minimum hardness value of 25 mg/L as defined in 9 VAC 25-260-140.
[3] WQC calculated based on the average hardness from historical sampling in 2017 and 2018 at RO-005.
[4] WQC calculated based on the hardness value of 50 mg/L used by VADEQ in 2015 when running a Wasteload Allocation Analysis in April 2015 based on OWP Guidance Memorandum 00-2011.
[5] WQC calculated based on a maximum hardness value of 100 mg/L as defined in 9 VAC 25-260-140.
Bold sample result indicates exceedance of one or more Water Quality Criteria.
Bold WQC that was exceeded based on results

Legend

- RO 006
- Drainage Area RO 006

N

Representative Outfall 006

0 0.005 0.01 0.02 Miles

SES Construction and Fuel Services LLC

5.6 RO-006 – VACANT LOT

The drainage area of ISW Representative Outfall 006 (RO-006) is located in the southwest region of Fort Belvoir. The Outfall is located just outside the fence near Theote Road and is a slightly depressed area in the southeast portion of the drainage area.

Run-off to RO-006 comes from the northwest, and stormwater is transported as sheet flow to the southeast corner of the lot. The stormwater flows in a grass channel parallel to Theote Road and then crosses the road through a culvert to the other side of Theote Road before discharging to an unnamed tributary to Gunston Cove. A substantial amount of precipitation is needed to ensure adequate stormwater samples can be collected at the ditch.

The outfall receives drainage from a parking lot area surrounded by a locked security fence. The lot is used by the Virginia National Guard as a vehicle parking area temporarily for pre-deployment staging of vehicles to be shipped to the 'theater', battlefield, or duty station. The lot is used intermittently dependent on mission requirements and at times may remain unused. Because only maintained vehicles are stored in the lot pre-deployment no industrial activities occur within the drainage area for RO-006.

5.6.1 RO-006 – SWMU Evaluation

As shown on the drainage map for RO-006, no SWMUs are present in this area.

Required Sampling: This evaluation indicated that Fort Belvoir is not required to characterize the stormwater runoff at Outfall RO-006 for the substances noted in Attachment A of the permit.

Legend

- RO 007 and 007A
- Drainage Areas RO 007
- Drainage Area RO 007A
- Waterway
- SWMU Point - Status: Active
- SWMU Area - Status: Closed

N

0 0.0275 0.055 0.11 Miles

Representative Outfall 007 and Outfall 007A

SES Construction and Fuel Services LLC

5.7 RO-007 – 21ST STREET FACILITY

The drainage area of ISW Representative Outfall 007 (RO-007) is located in the southwest region of Fort Belvoir. The Outfall is located just southwest of the 21st street debris collection facility and collects runoff from a large drainage area that includes a housing area and some administrative buildings. The system is also supposed to collect discharge from the debris collection facility via four (4) area inlets located within the northern portion of the facility.

Run-off to RO-007 comes from the northwest, and stormwater is transported into a closed conveyance system via curb inlets located within the housing and administrative areas. This discharge enters a stormwater pond just to the west of the industrial activity that occurs at the debris collection site. Discharge from the pond is conveyed via pipes to the final discharge point, RO-007, at the southwest of the drainage area after running beneath the 21st street debris collection facility. This means that the discharge from the industrial activity is comingled with that of the non-industrial area which may be found to dilute the final discharge.

Due to this comingling it was decided that the drainage area be reassessed in order to determine a location for sampling that is actually characteristic of the industrial activity. After a site evaluation a secondary point, referred to as RO-007A, was chosen for sampling. This point is located at the end of a small channel at a point at the southeast of the 21st debris collection facility. This point only receives surface runoff from the area used to collect, sort, crush debris at the facility. The runoff begins channelizing at the southernmost portion of the facility and finally discharges into the same stream as RO-007 but just to the northeast. This allowed Fort Belvoir to collect samples that were more characteristic of the industrial activities.

5.7.1 RO-007 – SWMU Evaluation

As shown on the drainage map for RO-007, five SWMUs are located within the drainage area of RO-007. Two sites are active SWMUs, two sites were approved for NFA with LUCs, and one site was approved for AC based on a review of historical records. These SWMUs are discussed below.

1. ***SWMU ID:*** A-04

   SWMU Name: Former Coal Storage Area

   Indoor/Outdoor: Outdoor

   Type, Function, and History: SWMU A-04 was identified as a former coal storage area. In January 2009, a Phase I RFI was performed at SWMU A-04. Field activities included the collection of soil and sediment samples which were analyzed for metals, VOCs, SVOCs, and pH levels. Based on this investigation and the current/anticipated industrial land use scenario, EPA Region 3 approved No Further Action for SWMU A-04. However, in order to ensure Fort Belvoir's continued compliance with the industrial land use scenario, a Land Use Control is required.

   Status: No Further Action (NFA)

   Level of Closure: Industrial

   Regulatory Approval: 12/07/2012

   Statement of Basis: 10/20/2014

   Residual COCs (if applicable):

   Soils: Arsenic (8.4 mg/kg), benzo(a)pyrene (32 ug/kg) in soil.

Sediment: Arsenic (11.1 mg/kg), benzo(a)pyrene (190 ug/kg), benzo(b)fluoranthene (320 ug/kg)

LUCs (if applicable): Activity Hazard Assessment (AHA) required for any construction

2. ***SWMU ID:*** A-23

SWMU Name: Former Coal Storage Area PCB Spill Site

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU A-23 was identified as a release of approximately 197 liters of dielectric transformer coolant, containing PCBs, from two vandalized transformers. The transformers were stored on a concrete pad, located in the old coal storage yard (SWMU A-04). The release was reported to US EPA in 1979, and sampling was conducted in August 1980 and October 1980.

Remedial actions took place in October 1982 and included the removal of 2,700 square feet of concrete and affected soil near the slab. Approximately 120 linear feet of sediment from the adjoining drainage ditch was also removed. The site was remediated to PCB concentrations below 50 mg/kg in accordance with the Toxic Substance Control Act (TSCA). After remediation was completed, the entire site was backfilled and covered in a concrete cap.

In 2013, Fort Belvoir performed a fate and transport evaluation for residual concentrations of Aroclor 1260 at SWMU A-23. Upon conclusion of the fate and transport evaluation, Fort Belvoir recommended No Further Action for SWMU A-23. EPA Region 3 approved NFA with Land Use Controls at site A-23 in a letter dated March 17, 2014. In the March 2014 letter, EPA Region 3 specified that the required land use controls must include continuation of restricted access to the site and adjacent areas; and as necessary, maintenance/repair to the existing concrete cap.

In February 2016, Fort Belvoir submitted a Site Summary Report Addendum for site A-23 to EPA Region 3. The Site Summary Report Addendum included an assessment of the condition and thickness of the concrete cap at A-23. The cap was found to be in good condition during the prior 2015 investigation activities, with adequate thickness to prevent contact with, or migration of, underlying soil that may contain residual PCBs. EPA Region 3 approved the Site Summary Report Addendum in February 2016. Fort Belvoir will continue to administer Land Use Controls at A-23 to address the 2014 EPA closure requirements and restrict residential development.

Status: No Further Action (NFA)

Level of Closure: Industrial

Regulatory Approval: 3/17/2014

Statement of Basis: Pending

Residual COCs (if applicable): N/A

LUCs (if applicable): Prohibit residential development without further evaluation of residential exposure risks; Restrict access to the site and adjacent area and maintain the existing concrete cover to limit human and ecological contact with residual PCB impacted soil; Control land use and construction in a manner that does not disturb the residual PCB impacted soil at the site, unless adequate safeguards are in place to protect workers, the community, and the environment

3. ***SWMU ID:*** L-09

SWMU Name: Former Coal Storage Area

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU L-09 was identified as an inactive outdoor concrete sump approximately 25 feet long by 10 feet wide by 5 feet deep. Historical documents suggest the unit

was an oil/water separator consisting of two chambers (one open, one closed) and both units contained what was reported as an oil/water mixture.

In 2008, a Phase I RFI was performed at SWMU L-09. Sampling results identified heavy metals, VOCs and SVOCs detected above their respective residential and industrial RBC values in sediment and surface water. Based on the findings of the Phase I RFI, Fort Belvoir proposed an interim removal action to remove the concrete structure at SWMU L-09; and, recommended No Further Action (NFA) at the site upon removal of the structure. EPA Region 3 approved the RFI recommendation of NFA, upon removal of the structure, in a letter dated August 5, 2013.

In February 2016, Fort Belvoir requested a modification to the previously approved remedy. The concrete structure is located in an area where there are limited human receptors. In addition, the concrete structure is actually part of the stabilization of the terrain and upon removal of the structure, the area would potentially destabilize. In an email to EPA dated February 3, 2016, Fort Belvoir recommended removal of any soil/sediments present in the concrete structure and analyze the soil/sediments for proper disposal; power wash the concrete structure and analyze the rinsate for proper disposal; collect concrete chip samples for analysis to confirm that the concrete structure will not be a source of contamination; and, submit a Final Removal Action and Closure Report for final approval and closure of site L-09. EPA Region 3 approved Fort Belvoir's modified strategy for L-09, in a letter dated February 4, 2016. In 2017, a contract was awarded to initiate the modified strategy for site L-09 in accordance with the requirements approved.

Status: Corrective Measures Implementation (CMI)

Level of Closure: **Active**

Regulatory Approval: Remedy Selected 02/04/2016

Statement of Basis: Pending

Residual COCs (if applicable):

Sediment: Arsenic (5.6 mg/kg) in soil. Arsenic (3.383 mg/Kg), lead (828 mg/Kg), mercury (28.16 mg/Kg), benzo(a)anthracene (7933.33 ug/Kg), benzo(a)pyrene (6566.66 ug/Kg), benzo(b)fluoranthene (8466.66 ug/Kg), benzo(k)fluoranthene (3500ug/Kg), bis(2-ethylhexyl)phthalate (72533.33ug/Kg), dibenz(a,h)anthracene (1203.33ug/Kg), indeno(1,2,3-c,d)pyrene (4300ug/Kg)

Surface Water: Arsenic (22.4 ug/L), cadmium (23.93 ug/L), chromium (295 ug/L), cobalt (16.2 ug/L), copper (1700 ug/L), lead (311.16 ug/L), silver (938 ug/L), mercury (16.16 ug/L), methylene chloride (8.5 ug/L), benzo(a)anthracene (0.265 ug/L), benzo(a)pyrene (0.366 ug/L), benzo(b)fluoranthene (0.416 ug/L), benzo(k)fluoranthene (0.336 ug/L), bis(2-ethylhexyl)phthalate (34.966 ug/L), indeno(1,2,3-c,d)pyrene (0.223 ug/L)

LUCs (if applicable): N/A

4. ***SWMU ID:*** MP-10

SWMU Name: 21st Street Liquid Dump Site

Indoor/Outdoor: Outdoor

Type, Function, and History: On January 18, 2012, approximately 250 gallons of sediment/grit and liquid were discovered at an unnamed tributary to Gunston Cove, located downstream of the 21st Street debris collection site. Upon investigation, it was found that the Fort Belvoir Base Operations Contractor had collected and discharged contents from a floor drain at Building 3145 (a hangar located on Davison Army Airfield) at the rear of the Fort Belvoir 21st Street debris collection site. This individual discharge and the subsequent fish kill were addressed under VADEQ Incident Report No. 2012-N-1900.

Although this action was determined to be a one-time release from the contractor, further site assessment (such as identification of distressed vegetation) indicated that historical releases may have occurred at this location. In 2017, a Phase I RFI was completed at site MP-10. Based on the RFI results and subsequent Ecological Risk Assessment, Fort Belvoir recommended No Further Action upon removal of the small sediment area that exceeded screening criteria. It also recommended enhanced stormwater controls at the Waste Collection Facility to reduce direct discharge to the ravine drainage and the tributary.

VADEQ approved the 2017 Phase I RFI on December 19, 2017 which required a Work Plan to be for the stormwater improvements. The Statement of Work was submitted to DPW-Engineering to provide and fund the required improvements at the site. The stormwater improvements are awaiting funding for design and construction. The Restoration group will be further investigating the effectiveness of the enhanced runoff control to the ravine drainage and the natural recovery of the inorganic surface water and sediment concentrations will be assessed through sampling near the headwaters of the stream as part of the long term management of the area after two to three years of enhanced runoff control activity.

Status: **Active**

Level of Closure: N/A

Regulatory Approval: N/A

Statement of Basis: N/A

Residual COCs (if applicable):

Sediment: arsenic(7.5 mg/kg), cobalt (34.2 mg/kg), benzo(a)pyrene (273 ug/kg)

LUCs (if applicable): N/A

5. ***SWMU ID:*** N-12

SWMU Name: Silver Recovery Unit

Indoor/Outdoor: Indoor

Type, Function, and History: SWMU N-12 was identified as a silver recovery unit in Room 220 of Building 214. Samples were taken from the waste debris resulting from the removal actions. The sampling results indicated that the silver contamination did not migrate to the outdoors. Based on a review of historical documentation for SWMU N-12 and documentation from remedial actions undertaken at the unit during the renovation of Room 220, Fort Belvoir recommended No Further Action for SWMU N-12. NFA was approved by EPA Region 3 for all land use scenarios; thus, no land use controls are required.

Status: No Further Action (NFA)

Level of Closure: UU/UE

Regulatory Approval: 1/9/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable): N/A

LUCs (if applicable): None

Required Sampling: Based on the presence of two active SWMUs within this drainage outfall, this evaluation determined that it is necessary for Fort Belvoir to monitor and characterize the discharge from RO-007. The results are discussed below.

5.7.2 RO-007 – SWMU Sample Analysis

A sample was collected at RO-007 on April 24, 2018 for the substances noted in Attachment A, "Water Quality Criteria Monitoring". The sample results for constituents detected above the specified Quantification Level (QL) are summarized in Table 6 below. All exceedances of Water Quality Criteria is highlighted in red. The information is provided even though this location is not characteristic of the industrial activity. The completed Attachment A and laboratory results are provided in Appendix G-3.

An additional sample was collected at RO-007A, the location indicated by VADEQ inspector as being more representative of the industrial activities, on March 1, 2019 for the substances noted in Attachment A, "Water Quality Criteria Monitoring". It had to be resampled on April 19, 2019 for Organophosphorus Pesticides and Nonylphenol due to holding times not being met for the required method. The sample results for constituents detected above the specified Quantification Level (QL) are summarized in Table 7 below. All exceedances of Water Quality Criteria is highlighted in red. This sampling location is found to be a better representation of the industrial activity occurring at the site as it is not mixed with the discharge from the upstream housing area. The completed Attachment A and laboratory results are provided in Appendix G-4.

These results were compared to the Virginia Water Quality Criteria (WQC) for surface waters as listed in 9VAC25-260-140. The Freshwater Acute WQC for copper, nickel, and zinc are a function of total hardness as calcium carbonate (CaCO3) mg/L and the Water Effect Ratio (WER). Attachment A does not require reporting of hardness and therefore this information was not collected. Due to hardness not being collected with this round of sampling, the minimum or conservative value of 25 mg/L, The maximum of 100 mg/L, the median of 50 mg/L that was used in the waste load allocation analysis completed by VADEQ in 2015, and the historical average of 69.7 mg/L was used for hardness values, while the WER was assumed to be '1'. Criteria values for the conservative, median, maximum, and average criteria are presented below for comparison. Calculation of WQC for each metal dependent on hardness are presented in Appendix F.

Acute Freshwater and Human Health WQC was not exceeded for any of the detected metals. Although low levels of copper, nickel, and zinc were detected, no other analyte listed in Attachment A was detected in samples.

Table 6: RO-007 Sample Result Summary

Analytes (Dissolved)	Freshwater Acute Criteria (ug/L)[1]				Human Health (ug/L)	Sample Result (ug/L)
	Conservative[2]	Average[3]	Median[4]	Maximum[5]		
Copper	3.64	9.56	6.99	13.44	–	***2.05***
Nickel	56.44	134.37	101.45	182.36	4600	***4.07***
Zinc	36.20	86.30	65.13	117.18	26000	***13.7***

[1] WQC for cadmium, chromium III, copper, lead, nickel, silver, and zinc are a function of total hardness as calcium carbonate (CaCO3) mg/L and the Water Effect Ratio (WER).
[2] WQC calculated based on a conservative or minimum hardness value of 25 mg/L as defined in 9 VAC 25-260-140.
[3] WQC calculated based on the average hardness from historical sampling in 2017 and 2018 at RO-007.
[4] WQC calculated based on the hardness value of 50 mg/L used by VADEQ in 2015 when running a Wasteload Allocation Analysis in April 2015 based on OWP Guidance Memorandum 00-2011.
[5] WQC calculated based on a maximum hardness value of 100 mg/L as defined in 9 VAC 25-260-140.
Bold sample result indicates exceedance of one or more Water Quality Criteria.
Bold WQC that was exceeded based on results

Table 7: RO-007A Sample Result Summary

Analytes (Dissolved)	Freshwater Acute Criteria (ug/L)[1]				Human Health (ug/L)	Sample Result (ug/L)
	Conservative[2]	Average[3]	Median[4]	Maximum[5]		
Antimony	–	–	–	–	640	***0.327***
Copper	3.64	9.56	6.99	13.44	–	***2.69***
Nickel	56.44	134.37	101.45	182.36	4600	***0.634***
Zinc	36.20	86.30	65.13	117.18	26000	***2.86***

[1] WQC for cadmium, chromium III, copper, lead, nickel, silver, and zinc are a function of total hardness as calcium carbonate (CaCO3) mg/L and the Water Effect Ratio (WER).
[2]WQC calculated based on a conservative or minimum hardness value of 25 mg/L as defined in 9 VAC 25-260-140.
[3] WQC calculated based on the average hardness from historical sampling in 2017 and 2018 at RO-007.
[4] WQC calculated based on the hardness value of 50 mg/L used by VADEQ in 2015 when running a Wasteload Allocation Analysis in April 2015 based on OWP Guidance Memorandum 00-2011.
[5] WQC calculated based on a maximum hardness value of 100 mg/L as defined in 9 VAC 25-260-140.
Bold sample result indicates exceedance of one or more Water Quality Criteria.
Bold WQC that was exceeded based on results

Legend

- RO 008
- Drainage Area RO 008
- Waterway
- Fort Belvoir Border

N

Representative Outfall 008

0 0.0275 0.055 0.11 Miles

SCF Ses Construction and Fuel Services LLC

5.8 RO-008 – ADFE NE

The drainage area for Outfall 008 is located on the northeast portion of the ADFE area of Fort Belvoir. The outfall is located in an unnamed stream just northeast of Buildings 2851 and 2857. The drainage area contains buildings 2800, 2813, 2822, 2821, 2859, 2808, 2840, 2841, 2860, 2834, 2851, 2854, 2855, 2856, and 2857.

The Outfall receives runoff from multiple facilities and outdoor activities, as well as offices, parking areas, and a stormwater pond. Most of the stormwater runoff at Outfall 008 comes from the west and generally flows in an eastern direction, running downhill towards an unnamed stream before heading east towards a river that drains into Dogue Creek.

Building 2860 is just northwest of Outfall 008 and contains diesel fuel. Runoff from this building runs south and feeds into the unnamed stream just prior to it being conveyed underneath the road.

Further northwest of Outfall 008 are buildings 2808, 2840, 2841 and an outdoor laydown area. Potential pollutants from this area are due to the storage of salt and other landscaping, construction, and maintenance equipment. Runoff from this area flows either downhill in the southeastern direction off the back of the lot. Or, in the northwestern direction down a trench drain located at the entrance of building 2841 and then downhill towards the head of the unnamed stream.

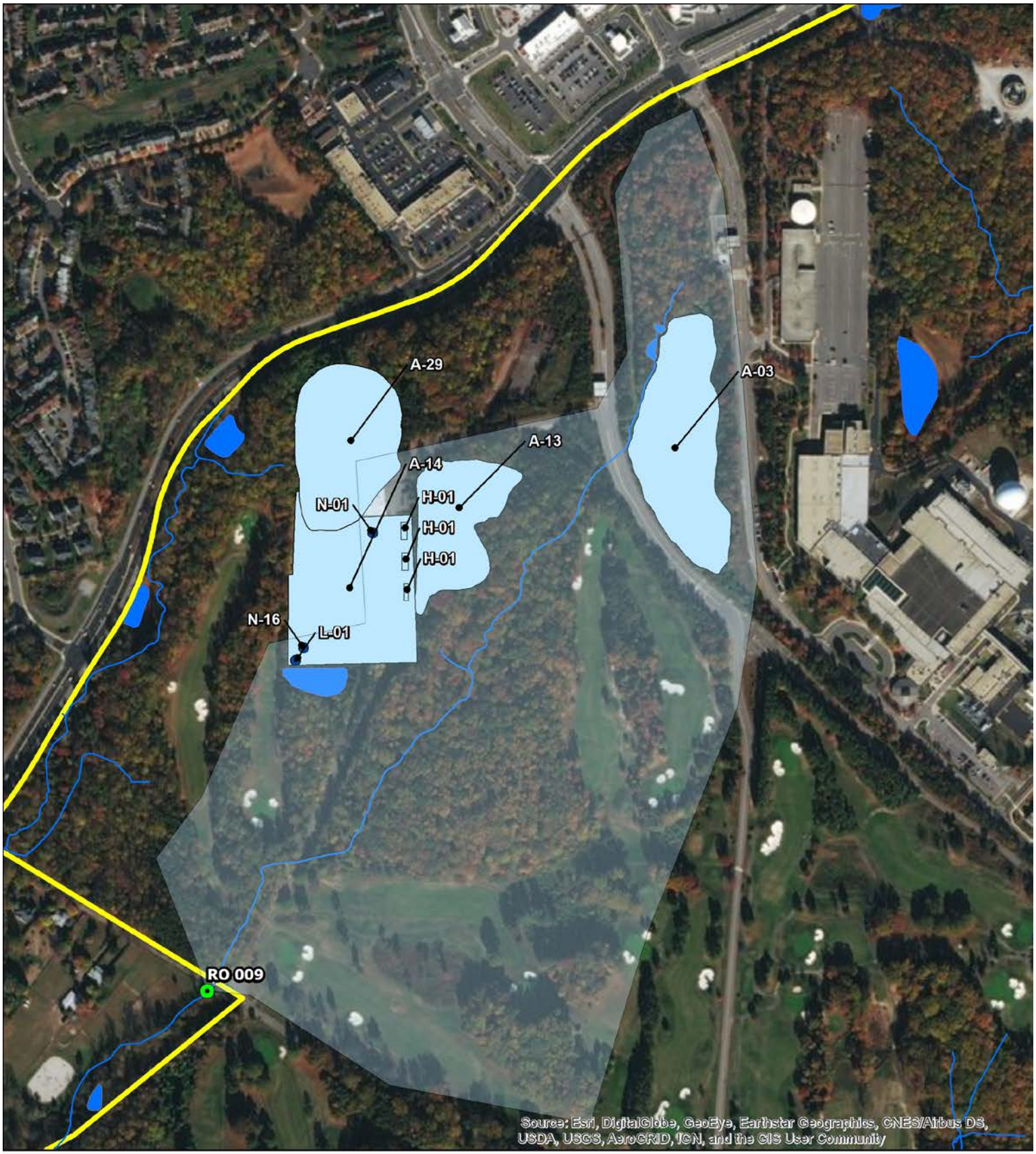
To the south of the outfall is a cluster of buildings including 2834, 2851, 2854, 2855, 2856, and 2857. Runoff from this area flows downhill or down the road in a northern direction towards the unnamed stream. Most of the activities in this area are conducted within the buildings or under cover. Building 2851 is a maintenance building containing a HVAC water treatment system. Building 2857 houses some glycol and diesel fuel. While 2834 is a covered and bermed area, with a flammable storage locker to house gasoline for landscaping equipment.

All other buildings located within the drainage area were assessed as having minimal contribution to industrial stormwater runoff to Outfall 008.

5.8.1 RO-008 – SWMU Evaluation

As shown on the drainage map for RO-008, no SWMUs are present in this area.

Required Sampling: This evaluation indicated that Fort Belvoir is not required to characterize the stormwater runoff at Outfall RO-008 for the substances noted in Attachment A of the permit.



Legend

- RO 009
- Drainage Area RO 009
- Waterway
- Fort Belvoir Border
- SWMU Point - Status: Closed
- SWMU Area - Status: Closed

N

Representative Outfall 009

0 0.05 0.1 0.2 Miles

SES Construction and Fuel Services LLC

5.9 RO-009 – GOLF COURSE MAINTENANCE FACILITY

The drainage area for Representative Outfall 009 (RO-009) is located in the northwest part of Fort Belvoir. A large portion, approximately one third, of the Fort Belvoir 36 hole Golf Course is within this drainage area, including the northwestern portion where the maintenance and lawn care buildings are located. These buildings include 2990, 2991, and 2993. These buildings are all located at the end of Swank Road just north-northeast of RO-009.

The majority of run-off to this outfall comes from the golf course greens cape which includes lawn, sand traps, and wooded areas for holes 11 through 16. Stormwater run-off at RO-009 is driven in large part by topography and flows from the higher elevations in the northeast and northwest to lower areas in the southwest portion of the drainage area.

The majority of industrial activities occur in the northwest portion of the drainage area which includes buildings 2990, 2991, and 2993. This area houses multiple material and waste storage areas with a 500 gallon diesel above ground storage tank (AST). Stormwater from the back of the maintenance facilities flows east off of the site towards an unnamed tributary. There is a storm pond located southwest of the paved area of the buildings and adjacent to Swank Road which captures run-off from the southern portion of the maintenance facilities.

All other buildings located within the drainage area were assessed as having minimal contribution to industrial stormwater runoff to RO-009.

5.9.1 RO-009 - SWMU Evaluation

As shown on the drainage map for RO-009, there are ten SWMUs located within the drainage area of RO-009. Seven SWMUs are closed with LUCs, two sites are NFA UU/UE, and one site is AC UU/UE. All ten SWMUs located within the drainage area of RO-009 are discussed below.

1. ***SWMU ID:*** A-03

   SWMU Name: DRMO Stump Dump

   Indoor/Outdoor: Outdoor

   Type, Function, and History: SWMU A-03 was identified as a suspected landfill located west of Old Beulah Street, south of Telegraph Road, and east of Beulah Street. In September 2008, a Phase I RFI was performed at SWMU A-03. Field activities included landfill delineation by test pit investigations, soil borings, groundwater monitoring well installations, surface water and sediment sampling, and landfill gas (LFG) probe installations and monitoring. Based on ecological and risk screenings of sample results from the Phase I investigation, regulators concurred with No Further Action for this site for industrial land use.

   Status: No Further Action (NFA)

   Level of Closure: Industrial

   Regulatory Approval: 7/30/2010

   Statement of Basis: 10/20/2014

   Residual COCs (if applicable):

   Soil: Arsenic (5.5 mg/kg), benzo(a)pyrene (70 ug/kg)

   Sediment: Lead (142 mg/kg)

   LUCs (if applicable): Activity Hazard Assessment (AHA) required for any construction

2. SWMU ID: A-10

SWMU Name: Lacey Pit Dump Area

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU A-10 was first identified as a landfill located approximately 500 feet west of Beulah Street. In May 2008, a Phase I RFI was performed at SWMU A-10. This investigation included landfill delineation through test pit investigations, soil and groundwater investigations, and landfill gas probe installations and monitoring. Based on the results of this investigation, No Further Action (NFA) was approved for this site for all land use scenarios (industrial and residential).

Status: No Further Action (NFA)

Level of Closure: UU/UE

Regulatory Approval: 01/09/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable):

Soil: arsenic (4.4 mg/kg), dieldrin (160 ug/kg)

LUCs (if applicable): None

3. SWMU ID: A-13

SWMU Name: DRMO Spoil Fill

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU A-13 was identified as a landfill located west of Beulah Street. In August 2008, a Phase I RFI was performed at SWMU A-13. Field activities included landfill delineation by test pit investigations, soil and groundwater investigations, surface water and sediment sampling and landfill gas probe installations and monitoring. Based on the findings of the Phase I investigation, No Further Action was recommended at SWMU A-13. EPA Region 3 approved NFA at SWMU A-13 based on current and anticipated land use.

Status: No Further Action (NFA)

Level of Closure: Industrial

Regulatory Approval: 01/09/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable):

Soil: arsenic (6.0 mg/kg), iron (60,900 mg/kg), lead (409 mg/kg), benzo(a)anthracene (250 ug/kg), benzo(a)pyrene (260 ug/kg), benzo(b)fluoranthene (300 ug/kg)

Surface Water: Manganese (763 ug/L)

LUCs (if applicable): Activity Hazard Assessment (AHA) required for any construction

4. SWMU ID: A-14

SWMU Name: DRMO Salvage Storage Area

Indoor/Outdoor: Outdoor

Type, Function, and History: The Defense Reutilization and Marketing Office (DRMO) Salvage Yard identified as SWMU A-14 was an outdoor unit consisting of mostly bare soil within a fenced area measuring approximately 500 feet by 300 feet. Installation records stated material previously stored on the surface at this site included scrap metal, vehicles, scrap cable and wire, equipment, appliances, furniture, and tires. In 2008, a Phase I RFI was conducted at SWMU A-14 in conjunction with SWMUs A-29, H-01, L-01, and L-35 due to proximity of these sites. Based

on the RFI, Fort Belvoir recommended No Further Action for industrial land use at site A-14. In August 2015, EPA Region 3 approved NFA with administrative land use controls at site A-14. Fort Belvoir will manage the administration of Land Use Controls for site A-14 under the collocated site, A-29.

Status: No Further Action (NFA)

Level of Closure: Industrial

Regulatory Approval: 08/06/2015

Statement of Basis: Pending

Residual COCs (if applicable):

Soil: arsenic (3.4 mg/kg), iron (73,800 mg/kg)

LUCs (if applicable): Due to location within SWMU A-14/A29, default LUCs include: (1) Site area to remain fenced with controlled access from Beulah Street & Swank Road; (2) Documentation of the LUC in the Fort Belvoir GIS system and Master Plan as a former SWMU site area; (3) Annual inspection of fencing, signage, site conditions.

5. SWMU ID: A-29

SWMU Name: Main Post DRMO Storage Area

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU A-29 is an inactive landfill located on North Post south of Telegraph Road and west of Woodlawn Road. In 2008, a Phase I RFI was conducted at SWMU A-29 in conjunction with SWMUs A-14, H-01, L-01, and L-35 due to the proximity of the sites. Based on the RFI, site A-29 was recommended for No Further Action (NFA) for industrial land use for the non-landfill portion of the site. However, because methane was detected above the lower explosive limit during the RFI investigation at Building 2990, Fort Belvoir committed to voluntarily monitoring landfill gas at Building 2990 semi-annually over a year duration.

EPA Region 3 approved NFA with land use controls at site A-29 in a letter dated August 6, 2015. In the August 2015 letter, EPA Region 3 specified additional conditions for closure of site A-29 to include the addition of administrative land use controls into the GIS system to document that waste management plans and health and safety precautions may be needed if development of the landfill site is considered; and, that Fort Belvoir will voluntarily monitor methane levels at the existing LFG probes and inside the adjacent structure (Building 2990) during two sampling events over the course of a year.

In November 2015, Fort Belvoir submitted an Internal Decision Document for site A-29 to EPA Region 3 for concurrence. The 2015 Internal Decision Document included a summary of the additional landfill gas monitoring efforts conducted at Building 2990 in the summer of 2014 and spring of 2015. The final remedy identified in the Internal Decision Document was NFA with land use controls. Land use controls are required to control development and prevent exposure to buried waste. EPA Region 3 approved the Internal Decision Document for site A-29 in a letter dated November 23, 2015.

Status: No Further Action (NFA)

Level of Closure: Industrial

Regulatory Approval: 11/23/2015

Statement of Basis: Pending

Residual COCs (if applicable):

Soil: arsenic (2.5 mg/kg), iron (172,000 mg/kg), vanadium (93.9 mg/kg)

Groundwater: Bis(2-ethylhexyl) phthalate (9.5 ug/L). manganese (1,060 ug/L)

LUCs (if applicable): (1) Site area to remain fenced with controlled access from Beulah Street & Swank Road; (2) Signage to indicate former landfill site boundaries; notify of excavation restrictions; (3) Documentation of the LUC in the Fort Belvoir GIS system and Master Plan to indicate that waste management plans and health and safety precautions may be needed if development of the landfill site is considered; (4) LUC geospatial data will be provided to the Master Planning Division of DPW for entry into the Fort Belvoir GIS. In an effort to facilitate the proper management of LUCs, 150-foot buffers will be added in the Fort Belvoir GIS and Msater Plan around SWMU A-14/A-29; (5) Adjunct methane monitoring will be conducted at overlapping SWMU A-29 during two sampling events per year until methane levels are sustained below 0.5% by volume; (6) Annual inspection of fencing, signage, site conditions. Extended to include area delineated as A-14; (7) Record keeping to include regular reporting of inspection results, transmittals to regulatory agencies.

6. SWMU ID: H-01

SWMU Name: DRMO Battery Storage Area

Indoor/Outdoor: Outdoor

Type, Function, and History: The DRMO Battery Storage Area (SWMU H-01) was identified as an area of approximately 20 feet by 150 feet utilized as a storage area for batteries located within the boundaries of SWMU A-14. In 2008, a Phase I RFI was conducted at SWMU H-01 in conjunction with SWMUs A-14, A-29, L-01, and L-35 due to proximity of these sites. Based on the RFI, Fort Belvoir recommended No Further Action for industrial land use at site H-01. In August 2015, EPA Region 3 approved NFA at site H-01. Fort Belvoir will manage the administration of industrial Land Use Controls for site H-01 under the collocated site, A-29.

Status: No Further Action (NFA)

Level of Closure: Industrial

Regulatory Approval: 08/06/2015

Statement of Basis: Pending

Residual COCs (if applicable):

Soil: arsenic (3.2 mg/kg)

LUCs (if applicable): Due to location within SWMU A-14/A29, default LUCs include: (1) Site area to remain fenced with controlled access from Beulah Street & Swank Road; (2) Documentation of the LUC in the Fort Belvoir GIS system and Master Plan as a former SWMU site area; (3) Annual inspection of fencing, signage, site conditions.

7. SWMU ID: L-01

SWMU Name: Spill Area SW Corner DRMO

Indoor/Outdoor: Outdoor

Type, Function, and History: The DRMO Spill Area (SWMU L-01) was identified as an area of approximately 45 feet by 15 feet located within the boundaries of SWMU A-14. Historical Installation records indicated that the area was used as a drainage swale and appeared to be stained black gray with an oily appearance. In 2008, a Phase I RFI was conducted at SWMU L-01 in conjunction with SWMUs A-14, A-29, H-01, and L-35 due to proximity of the sites. Based on the RFI, Fort Belvoir recommended No Further Action for industrial land use at site L-01. In August 2015, EPA Region 3 approved NFA at site L-01. Fort Belvoir will manage the administration of industrial Land Use Controls for site L-01 under the collocated site, A-29.

Status: No Further Action (NFA)

Level of Closure: Industrial

Regulatory Approval: 08/06/2015

Statement of Basis: Pending

Residual COCs (if applicable):

Soil: arsenic (1.9 mg/kg)

LUCs (if applicable): Due to location within SWMU A-14/A-29, default LUCs include: (1) Site area to remain fenced with controlled access from Beulah Street & Swank Road; (2) Documentation of the LUC in the Fort Belvoir GIS system and Master Plan as a former SWMU site area; (3) Annual inspection of fencing, signage, site conditions.

8. SWMU ID: L-35

SWMU Name: DRMO Salvage Storage Area Leaking Transformers

Indoor/Outdoor: Outdoor

Type, Function, and History: The DRMO Salvage Storage Area Leaking Transformers (L-35) was identified as an area of approximately 6 feet by 6 feet located within SWMU A-14. The area was reportedly impacted by a leaking transformer. In 2008, a Phase I RFI was conducted at SWMU L-35 in conjunction with SWMUs A-14, A-29, H-01, and L-01 due to proximity of these sites. Based on the RFI, Fort Belvoir recommended No Further Action for industrial land use at site L-35. In August 2015, EPA Region 3 approved NFA at site L-35. Fort Belvoir will manage the administration of industrial Land Use Controls for site L-35 under the collocated site, A-29.

Status: No Further Action (NFA)

Level of Closure: Industrial

Regulatory Approval: 08/06/2015

Statement of Basis: Pending

Residual COCs (if applicable):

Soil: arsenic (6 mg/kg), benzo(a)pyrene (24 ug/kg)

LUCs (if applicable): Due to location within SWMU A-14/A-29, default LUCs include: (1) Site area to remain fenced with controlled access from Beulah Street & Swank Road; (2) Documentation of the LUC in the Fort Belvoir GIS system and Master Plan as a former SWMU site area indicating that waste management plans and health and safety precautions may be needed if development in this area is considered; (3) Annual inspection of fencing, signage, site conditions.

9. SWMU ID: N-01

SWMU Name: Bldg 2991 (formerly Bldg 2506) Hazardous Waste Storage Area

Indoor/Outdoor: Indoor

Type, Function, and History: SWMU N-01 was identified as a hazardous waste storage area in Building 2506 (now 2991). Site closure was performed in 2000. A closure report, dated August 2001, was submitted to VDEQ recommending clean closure of the DRMO Hazardous Waste Area. VDEQ approved this recommendation in a letter dated October 23, 2002. NFA was approved by EPA Region 3 for all land use scenarios; thus, no land use controls are required.

Status: No Further Action (NFA)

Level of Closure: UU/UE

Regulatory Approval 9/21/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable): N/A

LUCs (if applicable): N/A

10. ***SWMU ID:*** N-16

SWMU Name: DRMO Hazardous Material Storage Area

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU N-16 was identified as an area used for the storage of unused/new hazardous materials in their original unopened containers. Review of historical records indicated that no release or spill had occurred at this site. A soil sample was collected near the site as part of a larger site investigation under the Phase I RFI for SWMUs A-14/A-29. The analytical results from the Phase I RFI for SWMUs A-14/A-29 indicated that the area had not been impacted.

Status: Administrative Closure (AC)

Level of Closure: UU/UE

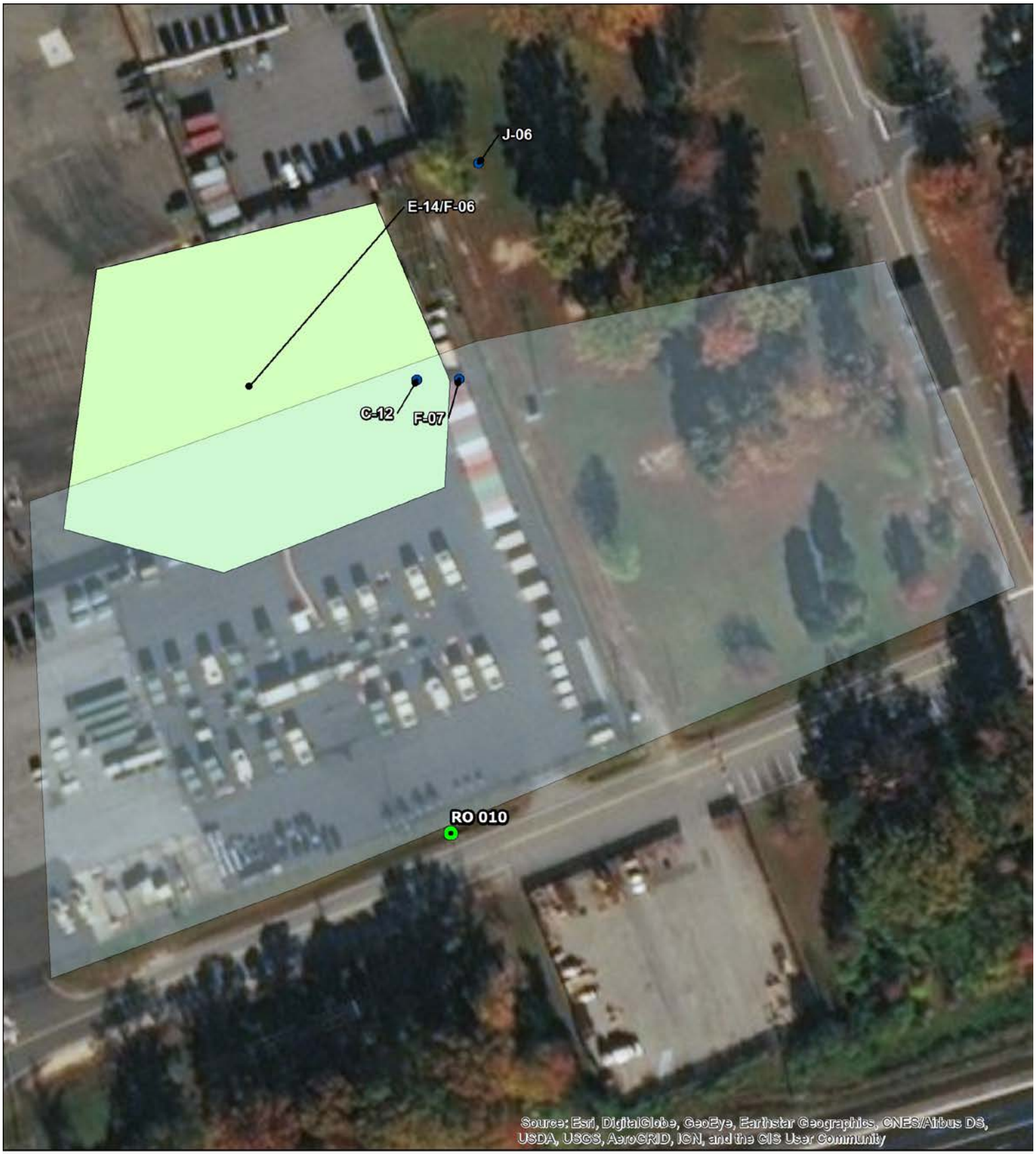
Regulatory Approval: 07/06/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable): N/A

LUCs (if applicable): N/A

Required Sampling: Based on the results of the extensive soil and groundwater sampling data from investigation of these SWMUs and the absence of active SWMUs, this evaluation indicated that Fort Belvoir is not required to characterize the stormwater runoff at Outfall RO-009 for the substances noted in Attachment A of the permit.



Legend

- RO 010
- Drainage Area RO 010
- SWMU Point - Status: Closed
- SWMU Area - Status: Closed

N

Representative Outfall 010

0 0.00750.015 0.03 Miles

SES Construction and Fuel Services LLC

5.10 RO-010 – OUTFALL NO LONGER ACTIVE

The drainage area for Representative Outfall 010 (RO-010) is located in the central region of Fort Belvoir. The Outfall was located in a drainage swale south of the 249th fenced area, alongside Meade Road, near a culvert. The area has been completely reconfigured due to the new entry gate onto the installation referred to as North Post Access Point.

This previous facility and associated organization were relocated in 2017, approximately 3 months after the permit effective date, as part of a realignment to accommodate the new access gate to the installation. As a part of the realignment the 249th was relocated to the corner of Pohick and Theote roads and the discharge is monitored under permitted RO-033.

Even though the outfall is no longer active, Part I.C.3.a states that the assessment should include any SWMUs that would be active as the effective date of the permit. Therefore the original drainage area for RO-010 was still screened for active SWMUs.

5.10.1 RO-010 – SWMU Evaluation

As shown on the drainage map for RO-010, five SWMUs are located within the drainage area of RO-010. Two SWMUs – E-14 and F-06 – are collocated, were investigated jointly and received an NFA concurrence, the other three SWMUs are AC to UU/UE. These SWMUs are discussed below.

1. ***SWMU ID:*** C-12
   SWMU Name: Building 1938 Wash Rack
   Indoor/Outdoor: Outdoor
   Type, Function, and History: SWMU C-12 was identified as a 25 foot by 25 foot concrete pad equipped with a water hose used for washing vehicles, located between Buildings 1938 and 1939. There were no historical records indicating that any type of release or impact to the nearby environment had occurred at this site. As such, SWMU C-12 received regulatory concurrence from US EPA Region 3 for Administrative Closure.
   Status: Administrative Closure (AC)
   Level of Closure: UU/UE
   Regulatory Approval: 07/06/2012
   Statement of Basis: 10/20/2014
   Residual COCs (if applicable): N/A
   LUCs (if applicable): N/A

2. ***SWMU ID:*** E-14
   SWMU Name: Building 1939 Waste POL Storage Area
   Indoor/Outdoor: Outdoor
   Type, Function, and History: SWMU E-14 was identified as an area where three abandoned 55-gallon drums that reportedly contained waste Petroleum, Oil, and Lubricants (POL) were stored. This site is collocated with SWMU F-06. The area where these SWMUs are located is relatively flat and consists of a small grassy area approximately 75 feet by 150 feet surrounded by an asphalt parking lot.
   A Phase I and Phase II RFI were performed at SWMU E-14 in 2008 and 2010, respectively. Soil borings were advanced to over 30 feet below ground surface and determined that soil impacts

were isolated within fill material and limited to between one to six feet below ground surface. Groundwater was not encountered during boring.

The current and anticipated future use of the site is parking and contractor storage. Based on the ecological assessment and risk screening of sample results from the Phase II investigation, Fort Belvoir received regulatory concurrence for No Further Action based on current and anticipated land use as industrial. EPA Region 3 approved NFA for the site in December 2013. In order to ensure compliance with industrial land use closure conditions, implementation of a land use control is required to address the PAHs which were detected above residential screening levels.

The site is also now being vetted for use by the Virginia National Guard for use and via the land transfer the potential for soil removal of the impacted area is being discussed. If this occurs a work plan would be submitted to VADEQ for approval of the new remedy which may result in a change in status of the site from Industrial standards to UU/UE.

Status: No Further Action (NFA)

Level of Closure: Industrial

Regulatory Approval: 12/11/2013

Statement of Basis: 10/20/2014

Residual COCs (if applicable):

Soil: benzo(a)anthracene (36,000ug/kg), benzo(a)pyrene (39,000 ug/kg), benzo(b)fluoranthene (37,000 ug/kg), chrysene (36,000 ug/kg), dibenz(a,h)anthracene (4,900 ug/kg), indeno(1,2,3-c,d)pyrene (19,000 ug/kg), naphthalene (510,000 ug/kg)

LUCs (if applicable): Activity Hazard Assessment (AHA) required for any construction

3. SWMU ID: F-06

SWMU Name: Building 1906 Above Ground Waste POL

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU F-06 was identified as an area where three abandoned 55-gallon drums that reportedly contained waste petroleum, oil, and lubricants (POL) were stored. This site is collocated with SWMU E-14. The area where these SWMUs are located is relatively flat and consists of a small grassy area approximately 75 feet by 150 feet surrounded by an asphalt parking lot.

A Phase I and Phase II RFI were performed at SWMU F-06 in 2008 and 2010, respectively. Soil borings were advanced to over 30 feet below ground surface and determined that soil impacts are isolated within fill material and limited to one to six feet below ground surface. Groundwater was not encountered.

The current and anticipated future use of the site is parking and contractor storage. Based on the ecological assessment and risk screening of sample results from the Phase II investigation, Fort Belvoir received regulatory concurrence for No Further Action based on current and anticipated land use. EPA Region 3 approved NFA for the site in December 2013. In order to ensure compliance with industrial land use closure conditions, implementation of a land use control is required to address the PAHs which were detected above residential screening levels.

The site is also now being vetted for use by the Virginia National Guard for use and via the land transfer the potential for soil removal of the impacted area is being discussed. If this occurs a work plan would be submitted to VADEQ for approval of the new remedy which may result in a change in status of the site from Industrial standards to UU/UE.

Status: No Further Action (NFA)

Level of Closure: Industrial

Regulatory Approval: 12/11/2013

Statement of Basis: 10/20/2014

Residual COCs (if applicable):

Soil: benzo(a)anthracene (12,000ug/kg), benzo(a)pyrene (14,000 ug/kg), benzo(b)fluoranthene (12,000 ug/kg), dibenz(a,h)anthracene (1,600 ug/kg), indeno(1,2,3-c,d)pyrene (6,400 ug/kg), naphthalene (110,000 ug/kg)

LUCs (if applicable): Activity Hazard Assessment (AHA) required for any construction

4. ***SWMU ID:*** F-07

SWMU Name: AST Waste POL Storage Area

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU F-07 was identified as a waste POL storage area behind Buildings 1938 and 1939. There were no historical records indicating that any type of historical release occurred. SWMU F-07 was located down gradient of a Phase I and Phase II investigation performed at neighboring SWMUs E-14 and F-06, where shallow and deep soil borings as well as groundwater samples were collected. Soil boring samples to the north (down gradient), collected during the Phase II Investigation at SWMUs E-14 and F-06 indicated that the environment had not been impacted. Based on these findings, there was no evidence or indication that a release of hazardous materials/constituents occurred from this unit. As such, SWMU F-07 received regulatory concurrence from US EPA Region 3 for Administrative Closure.

Status: Administrative Closure (AC)

Level of Closure: UU/UE

Regulatory Approval: 07/06/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable): N/A

LUCs (if applicable): N/A

5. ***SWMU ID:*** J-06

SWMU Name: Former Incinerator

Indoor/Outdoor: Indoor

Type, Function, and History: SWMU J-06 was identified as a former propane fired incinerator used for destroying classified documents. The unit was located adjacent to Building 1927. The incinerator was deactivated in 1999. A review of historical records indicated that there were no releases of hazardous material or impacts to the environment from operation of this unit.

Status: Administrative Closure (AC)

Level of Closure: UU/UE

Regulatory Approval: 07/06/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable): N/A

LUCs (if applicable): N/A

Required Sampling: Based on the site conditions, record searches, UU/UE closures, and absence of active SWMUs, this evaluation indicated that Fort Belvoir is not required to characterize the stormwater runoff at RO-010 for the substances noted in Attachment A of the permit.

Legend

- RO 010
- Drainage Area RO 011
- Waterway
- SWMU Point - Status: Closed
- SWMU Area - Status: PMP

N

Representative Outfall 011

0 0.0075 0.015 0.03 Miles

SES Construction and Fuel Services LLC

5.11 RO-011 – MEADE ROAD WASH RACK

The drainage area for Outfall 011 is located in the central region of Fort Belvoir just north of Route 1. The outfall is located at the southernmost tip of the drainage area just outside the fence for the washrack facility. This area is primarily paved impervious surfaces with a grassy swale running northeast to southwest across the drainage area. The drainage area contains buildings 1984, 1949, 1950 and several storage sheds.

The outfall receives run-off from a motorpool, several large paved parking lots, and a fully operational vehicle washrack. The washrack drains into a sedimentation basin that is attached to an oil water separator (OWS) to treat the discharge from sediment and oils/greases before being collected and discharged to the sanitary sewer. Most of the stormwater run-off at Outfall 011 is conveyed via sheet flow from paved surfaces that empties into a grassy swale which then drains into an open drainage ditch from the northeast to the southwest.

Stormwater from buildings 1949 and 1950, and their surrounding impervious lots, flows off the site in a southern direction to an open trench that directs the stormwater west and down to the grassy area to the west of the washrack. The stormwater meets up with the sheetflow coming from the southern portion of building 1984, the pump station for the washracks, which flows south of the washracks into an earthen trench along the southern portion of the lot. The runoff generally flows towards an unnamed stream that drains into Accotink Creek and then into Accotink Bay.

Industrial activities occur in the northwestern portion of the drainage area which includes buildings 1950, 1949, several sheds, and a vehicle and equipment storage lot. This area houses multiple material and waste storage areas, a 250-gallon used oil AST and a gasoline AST. The sheds are used to store hazardous and waste materials. Basic vehicle maintenance activities are conducted within buildings 1949 and 1950.

5.11.1 RO-011 SWMU Evaluation

As shown on the drainage map for RO-011, five SWMUs are located within the drainage area of RO-011. One SWMU – N-02 - is AC and is being managed under Fort Belvoir's Petroleum Management Program, two SWMUs – F-04 and N-18 – both NFA UU/UE, were in close proximity and were closed jointly, and two SWMUs are AC UU/UE. These SWMUs are discussed below

1. ***SWMU ID:*** C-07
   SWMU Name: Base Wash Rack Area
   Indoor/Outdoor: Indoor
   Type, Function, and History: SWMU C-07 was identified as a single, indoor vehicle wash rack located in Building 1984. Historical records for SWMU C-07 indicated that there were no documented releases or spills of hazardous materials to the environment related to this wash rack.
   Status: Administrative Closure (AC)
   Level of Closure: UU/UE
   Regulatory Approval: 07/06/2012
   Statement of Basis: 10/20/2014
   Residual COCs (if applicable): N/A
   LUCs (if applicable): N/A

2. ***SWMU ID:*** D-08

SWMU Name: Base Wash Rack OWS

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU D-08 was identified as a two-stage oil/water separator that received wash water from wash rack SWMU C-07. The oil/water separator and wash rack located next to Building 1985 no longer exist. There were no historical records indicating that any type of release or impact to the nearby environment had occurred at this site.

Status: Administrative Closure (AC)

Level of Closure: UU/UE

Regulatory Approval: 07/06/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable): N/A

LUCs (if applicable): N/A

3. ***SWMU ID:*** F-04

SWMU Name: Building 1949/1950 AST Waste POL and Pad

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU F-04 was identified as a mobile 200-gallon AST located on a concrete pad. According to the 1992 Solid Waste Management Unit Study, the 200-gallon AST had been removed and replaced by a 1,000-gallon AST in 1989, which was connected to an oil/water separator (SWMU N-18). Closure activities for SWMU F-04 and SWMU N-18 (located nearby) were initiated in May 1996. In December 1997, Fort Belvoir submitted a closure report to VDEQ that documented all closure activities and recommended No Further Action. VDEQ approved this recommendation in a letter dated May 21, 1999.

Status: No Further Action (NFA)

Level of Closure: UU/UE

Regulatory Approval: 09/21/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable):

> ***Soil:*** arsenic(5.04 mg/kg), barium (37.7 mg/kg), chromium (41.5 mg/kg), lead (10.2 mg/kg), selenium (0.288 mg/kg)

LUCs (if applicable): N/A

4. ***SWMU ID:*** N-02

SWMU Name: Waste POL Storage Area

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU N-02 was identified as two, single-walled 250-gallon ASTs located within a fenced in bermed concrete pad (30 feet by 20 feet) on the north side of Building 1950. This site still currently maintains two, active 250-gallon ASTs used to manage waste oil; however, these ASTs are managed under the installation's Petroleum Management Program (PMP). As this site is being appropriately managed under this program and active USTs do not meet the definition of a SWMU, SWMU N-02 received regulatory concurrence from US EPA Region 3 for Administrative Closure.

Status: Administrative Closure (AC)

Level of Closure: Managed under Petroleum Management Program (PMP)

Regulatory Approval: 07/06/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable): N/A

LUCs (if applicable): N/A

5. ***SWMU ID:*** N-18

SWMU Name: Bilge Water Separator

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU N-18 was identified as an oil/water bilge water separator for boats serviced in Building 1949. A closure report documented all closure activities and recommended No Further Action for the site. The closure report was submitted to VDEQ in February 1998. VDEQ approved the NFA recommendation in a letter dated May 21, 1999.

Status: No Further Action (NFA)

Level of Closure: UU/UE

Regulatory Approval: 9/21/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable):

Soil: arsenic(5.04 mg/kg), barium (37.7 mg/kg), chromium (41.5 mg/kg), lead (10.2 mg/kg), selenium (0.288 mg/kg)

LUCs (if applicable): N/A

Required Sampling: Based on the soil sample results, record searches, UU/UE closures, and absence of active SWMUs, this evaluation indicated that Fort Belvoir is not required to characterize the stormwater runoff at Outfall RO-011 for the substances noted in Attachment A of the permit.

Legend

- RO 012
- Drainage Area RO 012
- Waterway
- SWMU Point - Status: Closed

N

Representative Outfall 012

0 0.01 0.02 0.04 Miles

SES Construction and Fuel Services LLC

5.12 RO-012 – MOSBY RESERVE MOTORPOOL

The drainage area for Representative Outfall 012 (RO-012) is located in the central region of Fort Belvoir just north of Route 1. RO-012 is fitted with an energy dissipater and is located in an open drainage culvert (lined with riprap) at the southernmost tip of the drainage area, approximately 40 meters southwest of the covered pavilion in the southeast portion of the Motorpool. The representative drainage area contains buildings 2470, 2473, and a Motorpool.

The outfall receives run-off from the Mosby Reserve Center (Army Reserve) which consists of two buildings and two parking areas. Most of the stormwater run-off at RO-012 is conveyed through several drainage pipes that move water from the north-northeast to the south-southwest. Two curb inlets are located along the southeastern fence line of the facility and carry sheet flow from the Motorpool areas. From RO-012 the water then flows to an unnamed stream before heading southwest towards Accotink Creek.

The majority of the industrial activities occur in the southeast portion of the drainage area which includes six distinct areas including buildings 2470 and 2473, an inactive washrack area, two (2) vehicle/equipment storage areas, and a covered storage area. All other buildings located within the drainage area were assessed as having minimal contribution to industrial stormwater run-off to RO-012.

5.12.1 RO-012 SWMU Evaluation

As shown on the drainage map for RO-012, two SWMUS are located within the drainage area of RO-012. Both SWMUs are AC UU/UE based on a review of historical records, which indicated that there were no documented releases or spills of hazardous materials to the environment in relation to them. These two SWMUs are discussed below.

1. ***SWMU ID:*** C-03
   SWMU Name: Building 1356 Wash Rack
   Indoor/Outdoor: Outdoor
   Type, Function, and History: SWMU C-03 was identified as a 30 foot by 50 foot asphalt pad used for washing vehicles located south of Building 2473 (formerly 1356). Historical records for SWMU C-03 indicated that there were no documented releases or spills of hazardous materials to the environment related to the wash rack. The wash water drained into trench drains, which discharged to an oil/water separator (SWMU N-14); and, then drained into the Fort Belvoir's sanitary sewer system. The Washrack is no longer active
   Status: Administrative Closure (AC)
   Level of Closure: UU/UE
   Regulatory Approval: 7/6/2012
   Statement of Basis: 10/20/2014
   Residual COCs (if applicable): N/A
   LUCs (if applicable): N/A

2. ***SWMU ID:*** N-14
   SWMU Name: Building 1356 OWS
   Indoor/Outdoor: Outdoor
   Type, Function, and History: SWMU N-14 was identified as a concrete gravity oil/water separator that measured approximately 10 feet by 4 feet. The unit received wash water from

adjacent wash rack, SWMU C-03. Review of historical records indicated that no release or spill had occurred at the site. The wash rack had been inactive since the 1980s.

Status: Administrative Closure

Level of Closure: UU/UE

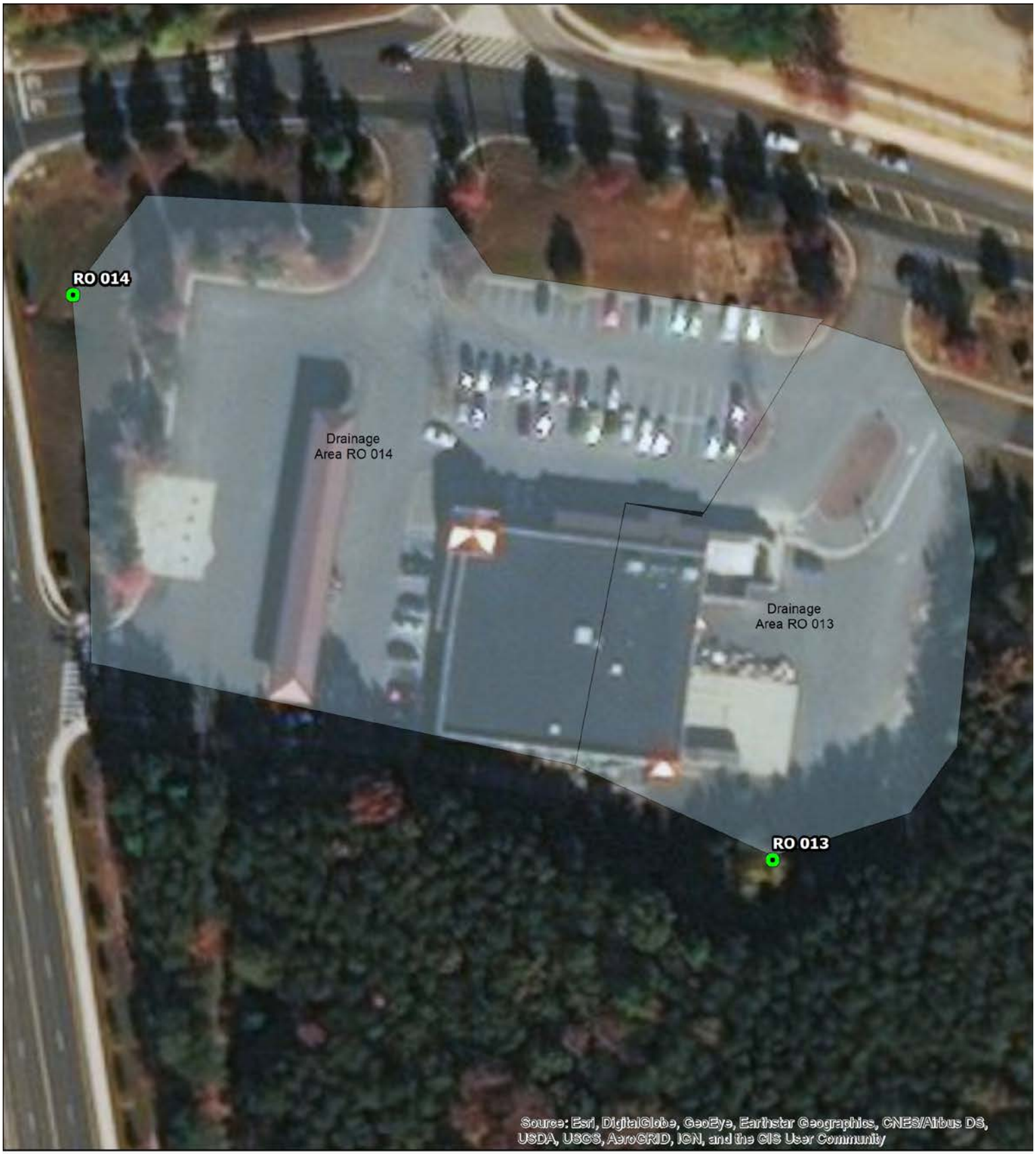
Regulatory Approval: 7/6/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable): N/A

LUCs (if applicable): N/A

Required Sampling: Based on the record searches, AC UU/UE closures, and absence of active SWMUs, this evaluation indicated that Fort Belvoir is not required to characterize the stormwater runoff at Outfall RO-012 for the substances noted in Attachment A of the permit.



Legend

- RO 013 and 014
- Drainage Area RO 013 and 014

N

Representative Outfalls 013 and 014

0 0.0050.01 0.02 Miles

SES Construction and Fuel Services LLC

5.13 RO-013 – ARBY'S

The drainage area for Representative Outfall 013 (RO-013) is located in the northeastern region of Ft. Belvoir across from Ft. Belvoir's Commissary parking lot. The outfall is located in the southernmost tip of the drainage area approximately 20 meters southwest of the lot behind the building. The drainage area contains a portion of Building 2304 (Arby's fast food restaurant), a row of dumpsters, grease storage tanks, storage units, unused refrigeration units, a cardboard compactor, and a loading dock.

The Outfall receives run-off from Arby's fast food restaurant/parking lot and the northeast part of an AAFES Class Six convenience store parking lot and loading dock. Surface water from the western part of the AAFES facility drains to ISW RO-014, while the eastern side drains to RO-013. Most of the stormwater run-off leading to Outfall 013 is conveyed via sheet flow to a curb inlet before daylighting at a pipe to the southeast of the facility.

5.13.1 RO-013 – SWMU Evaluation

As shown on the drainage map for RO-013, no SWMUs are present in this area.

Required Sampling: This evaluation indicated that Fort Belvoir is not required to characterize the stormwater runoff at Outfall RO-013 for the purposes of this permit requirement.

5.14 RO-014 – AAFEES CLASS SIX STATION

The drainage area for Representative Outfall 014 (RO-014) is located in the northeastern region of Ft. Belvoir across from Ft. Belvoir's Commissary parking lot. RO-014 is located just northwest of the building in a stormwater catchment pond near the intersection of Stonewall Jackson Road and Gunston Road. The drainage area encompasses the western half of Building 2304 which is an AAFES Class Six Fuel Station with a convenience store.

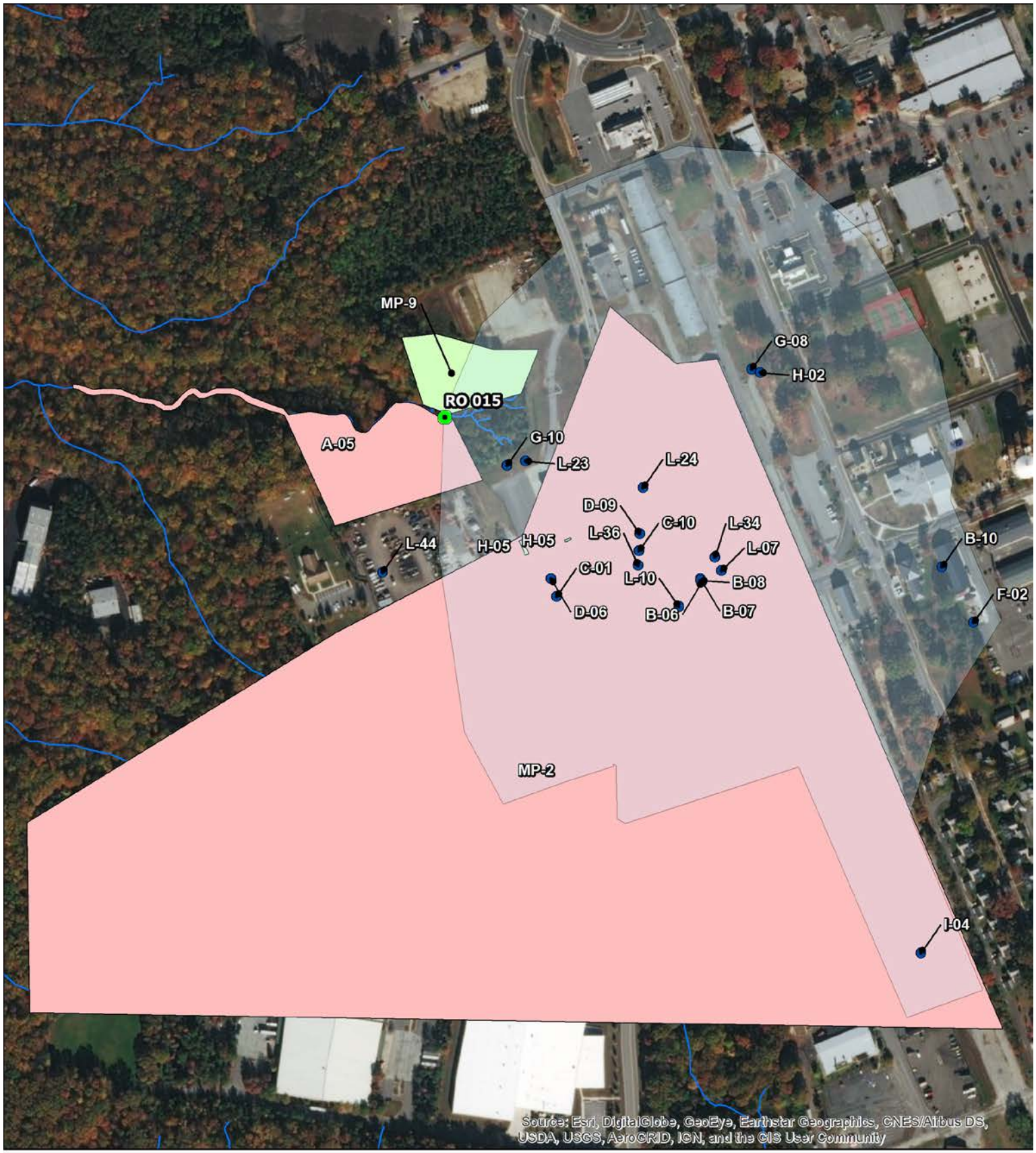
The surface water from the western part of the AAFES facility drains to RO-014, while the eastern side drains to RO-013. Most of the stormwater run-off leading to RO-014 is conveyed through a series of storm drains and pipes from the northeast to the west. From RO-014 water flows into a retaining pond where it than flows towards an unnamed tributary before heading south-southwest towards Accotink Creek.

The majority of the industrial activities occur in the central to southeast portion of the drainage area which includes the fueling pumps. This area houses five (5) 10,000 gallon tanks. West of Building 2304 and under a canopy are six (6) gas dispensers and two (2) air pumps for tires and vacuums.

5.14.1 RO-014 – SWMU Evaluation

As shown on the drainage map for RO-014, no SWMUs are present in this area.

Required Sampling: This evaluation indicated that Fort Belvoir is not required to characterize the stormwater runoff at Outfall RO-014 for the purposes of this permit requirement.



Legend

- RO 015
- Drainage Area RO 015
- Waterway
- SWMU Point - Status: Closed
- SWMU Area - Status: Closed
- SWMU Area - Status: Active

N

Representative Outfalls 015

0 0.0375 0.075 0.15 Miles

SES Construction and Fuel Services LLC

5.15 RO-015 – 16TH STREET FACILITIES

The drainage area for Representative Outfall 015 (RO-015) is in the southeastern region of Fort Belvoir approximately ½ mile from Accotink Bay. The outfall is an open drainage ditch located in the easternmost tip of the drainage area approximately 100 meters northeast of Building 1116. The drainage area for ISW Outfall 015 encompasses a large area that houses a variety of facilities. Buildings of most concern within the drainage area are buildings 190, 1124, 1110, 1113, 1114, 1117, and 1192.

Run-off to RO-015 comes from a variety of different facilities to include: storage facilities, offices, a vehicle maintenance shop, vehicle washing station, fire department, food services, and a fueling station. Most of the stormwater run-off leading to Outfall 015 is conveyed through a series of storm drains and pipes from the south-southeast, and runs in a north-northwest direction passing through the 16th Street Storage Area (Base Operations) Facility before draining to a catchment basin. From the catchment basin, the water flows northwest towards an unnamed stream before heading directly west to Accotink Bay.

5.15.1 RO-015 – SWMU Evaluation

As shown on the drainage map for RO-015, twenty-four SWMUs are located within the drainage area of RO-015. These SWMUs are A-05, MP-2, B-06, B-07, B-08, B-10, C-01, C-10, D-06, D-09, F-02, G-08, G-10, H-02, H-05, I-04, L-07, L-10, L-23, L-24, L-34, L-36, L-44, and MP-9. Two SWMUs are active – MP-2 requires investigation and A-05 is undergoing corrective measures. Two SWMUs – B-08 and L-34 – are/were being managed under Fort Belvoir's Petroleum Management Program as part of the Building 1124 Vehicle Fueling Facility cleanup. One SWMU – MP-9 - is closed with LUCs, ten are No Further Action UU/UE, and nine SWMUs are Administratively Closed UU/UE. These 24 SWMUs are discussed below.

1. ***SWMU ID:*** A-05

   SWMU Name: Roads and Grounds/Land Management Storage Area

   Indoor/Outdoor: Outdoor

   Type, Function, and History: SWMU A-05 was identified as a suspected unlined landfill which was in use prior to 1968. Phase I and Phase II RFIs were completed which determined the presence of contamination in groundwater, subsurface soil, surface soil, sediment, and surface water.

   The Phase I RFI was completed in 2009. Investigation results determined the presence of volatile organic compounds (VOCs) in groundwater. Based on the results of the 2009 RFI, a Phase II RFI was performed to determine the nature and extent of contamination at the site. The 2010/2011 Phase II RFI evaluated soil gas, subsurface soil, groundwater, surface soil, sediment, and surface water. Human health risk and ecological screening found that there are potential concerns for human exposure at SWMU A-05.

   The Final Corrective Measure Study (CMS) Report documented the preferred corrective measure for remediation of groundwater at CC-A05 as In-Situ Enhanced Bioremediation, Bio-augmentation, long-term groundwater monitoring, land use controls (LUCs) and monitored natural attenuation (MNA), The estimated timeframe until remedial goals for PCE in the stream to be achieved is about 16 years but may take upwards of 30 years.

   EPA Region 3 issued a letter approving the Final CMS Report on June 18, 2014. Long-term groundwater monitoring was initiated in 2015. The initial injections as part of the In-Situ Enhanced Bioremediation portion of the remedy were completed in April and May 2015. A second injection event was conducted in November 2017. A third round of injections is planned for 2020.

Status: Corrective Measure Implementation (CMI)

Level of Closure: **Active**

Regulatory Approval: Remedy Selected 06/18/2014

Statement of Basis: 10/31/2014

Residual COCs (if applicable):

Soil: aluminum (9,970 K mg/kg)**,** arsenic (6.3 J mg/kg)**,** chromium (445 J mg/kg)**,** cobalt (8 J mg/kg)**,** iron (41,900 J mg/kg)**,** manganese (301 J mg/kg)**,** benzo(a)pyrene (55 ug/kg)**,** dibenz[a,h]anthracene (32 ug/kg)**,** PCE (3,100 ug/kg)

Sediment: PCE (ave. 80.8 ug/kg; max. 584 ug/kg)

Groundwater: PCE (ave. 1,552ug/L; max. 10,800 ug/L), TCE (ave. 64 ug/L; max 627 ug/L), cis-1,2-DCE (ave. 409 ug/L; max 3,260 ug/L)

Surface Water: PCE (ave. 147 ug/L; max. 460 ug/L)

LUCs (if applicable): Prevent exposure via vapor intrusion in the unlikely event that a building is to be constructed over the plume. (Interim LUC)

2. ***SWMU ID:*** B-06

SWMU Name: Building 1124 UST Hazardous Waste System-1

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU B-06 is an inactive unit described as a 12,000-gallon steel, double-walled UST used for storing waste oil located at Building 1124. The UST was registered with VDEQ as UST #01124C. Phase I and Phase II environmental site investigations performed on the site, determined the environment around the site had been impacted. Closure by VDEQ was requested in 1994 after analytical results showed that levels of the contaminants of concern had decreased substantially due to natural biodegradation of the compounds in the groundwater. Letters from VDEQ concurring that the case was closed were received in 1994 and 1999.

Additionally, the surrounding area around B-06 is being addressed under a corrective action program for Building 1124, Vehicle Fueling Facility. A pump and treat soil vapor extraction system was designed and constructed to address the hydrocarbons in the soil and groundwater in the vicinity of Building 1124. The Building 1124 petroleum site (PC #1999-3377) received case closure by VDEQ in November 2013.

A large PCE groundwater plume (SWMU MP-2) that was discovered during a stormwater improvement project conducted near Building 1124, Vehicle Fueling Facility is located beneath site B-06. Any residual petroleum contamination remaining in soil or groundwater at SWMU B-06 would be managed under the Corrective Measures at SWMU MP-2. NFA was approved by EPA for all land use scenarios; thus, no land use controls are required.

Status: No Further Action (NFA)

Level of Closure: UU/UE

Regulatory Approval: 09/21/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable):

Groundwater: TPH-DRO (17.8 mg/L), TPH-GRO (41.7 mg/L), benzene (3,420 ug/L)

LUCs (if applicable): N/A

3. ***SWMU ID:*** B-07

SWMU Name: Building 1124 UST Hazardous Waste System-2

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU B-07 is an inactive unit described as a 12,000-gallon steel, double-walled UST used for storing waste oil located approximately 40 feet northwest of Building 1124. In 2005, the UST was closed in accordance with the VDEQ approved Closure Plan which included rinsing the tank and performing a tightness test. A closure report recommending No Further Action was submitted to VDEQ for Hazardous Waste Management Unit (HWMU) 1124 (SWMU B-07) Underground Hazardous Waste Storage Tank at Building 1124, in April 2005. VDEQ concurred with this recommendation in a letter dated June 21, 2006.

Additionally, the surrounding area around B-07 has been addressed under a corrective action program for Building 1124, Vehicle Fueling Facility. A pump and treat soil vapor extraction system was designed and constructed to address the hydrocarbons in the soil and groundwater in the vicinity of Building 1124. The Building 1124 petroleum site (PC #1999-3377) received case closure by VDEQ in November 2013.

A large PCE groundwater plume (SWMU MP-2) that was discovered during a stormwater improvement project conducted near Building 1124, Vehicle Fueling Facility is located beneath site B-07. Any residual petroleum contamination remaining in soil or groundwater at SWMU B-07 would be managed under the Corrective Measures at SWMU MP-2. NFA was approved by EPA for all land use scenarios; thus, no land use controls are required.

Status: No Further Action (NFA)

Level of Closure: UU/UE

Regulatory Approval: 09/21/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable):

Groundwater: TPH-DRO (17.8 mg/L), TPH-GRO (41.7 mg/L), benzene (3,420 ug/L)

LUCs (if applicable): N/A

4. ***SWMU ID:*** B-08

SWMU Name: Building 1124 UST Hazardous Waste System-3

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU B-08 is identified as a 12,000-gallon waste underground storage tank (UST) located at Building 1124. The UST and impacted soil was removed in 1986 after approximately 10,000 gallons of used oil and automotive fluids were released.

Environmental investigations were conducted between 1986 and 1994 and closure was approved by VDEQ after analytical results showed that levels of the COCs had decreased substantially due to natural biodegradation of the compounds in the groundwater. Letters from VDEQ concurring that the case was closed were received in 1994 and 1999.

Additionally, the surrounding area around B-08 has been addressed under a corrective action program for Building 1124, Vehicle Fueling Facility. The Building 1124 petroleum site (PC #1999-3377) received case closure by VDEQ in November 2013. As SWMU B-08 is being appropriately managed under Fort Belvoir's Petroleum Management Program, this unit received EPA concurrence for Administrative Closure under RCRA.

Status: Administrative Closure (AC)

Level of Closure: Managed under Petroleum Management Program (PMP)

Regulatory Approval: 07/06/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable): N/A

Groundwater: TPH-DRO (17.8 mg/L), TPH-GRO (41.7 mg/L), benzene (3,420 ug/L)

LUCs (if applicable): N/A

5. ***SWMU ID:*** B-10

   SWMU Name: Former PCB Storage Room

   Indoor/Outdoor: Indoor

   Type, Function, and History: SWMU B-10 was identified as a room used to store PCB containing materials. Historical records for SWMU B-10 indicated that there were no documented releases or spills related to the storage of the hazardous material. Additionally the site was located indoors and therefore could not affect the surrounding environment.

   Status: Administrative Closure (AC)

   Level of Closure: UU/UE

   Regulatory Approval: 07/06/2012

   Statement of Basis: 10/20/2014

   Residual COCs (if applicable): N/A

   LUCs (if applicable): N/A

6. ***SWMU ID:*** C-01

   SWMU Name: Roads and Grounds Land Management Wash Rack

   Indoor/Outdoor: Outdoor

   Type, Function, and History: SWMU C-01 was identified as a small vehicle washing area. Historical records for SWMU C-01 indicated that there were no documented releases or spills of hazardous materials to the environment related to the former wash rack or runoff water collected in a nearby sump area (SWMU D-06). Additionally, the wash rack no longer exists and was paved over sometime between 1992 and 2005.

   Status: Administrative Closure (AC)

   Level of Closure: UU/UE

   Regulatory Approval: 07/06/2012

   Statement of Basis: 10/20/2014

   Residual COCs (if applicable): N/A

   LUCs (if applicable): N/A

7. ***SWMU ID:*** C-10

   SWMU Name: Former Heavy Equipment Wash Rack

   Indoor/Outdoor: Outdoor

   Type, Function, and History: SWMU C-10 was identified as a 40 foot by 15 foot concrete pad used as a wash rack located adjacent to Building 1119. According to the 1988 Phase II RFA, the unit consisted of a drain approximately 25 feet long which connected to an oil/water separator (SWMU D-09), that managed all wash water runoff from the unit. Review of historical documentation of SWMU C-10 indicated that no release or spill of hazardous material to the environment occurred at the former wash rack.

   Status: Administrative Closure (AC)

   Level of Closure: UU/UE

   Regulatory Approval: 07/06/2012

Statement of Basis: 10/20/2014
Residual COCs (if applicable): N/A
LUCs (if applicable): N/A

8. ***SWMU ID:*** D-06
SWMU Name: Roads and Grounds Land Management Sump
Indoor/Outdoor: Outdoor
Type, Function, and History: SWMU D-06 was identified as a 4 foot by 4 foot depression in the bare ground where wash water was collected from vehicle washing operations occurring at a nearby wash rack (SWMU C-01). There were no historical records indicating that any type of release or impact to the nearby environment had occurred at this site.
Status: Administrative Closure (AC)
Level of Closure: UU/UE
Regulatory Approval: 07/06/2012
Statement of Basis: 10/20/2014
Residual COCs (if applicable): N/A
LUCs (if applicable): N/A

9. ***SWMU ID:*** D-09
SWMU Name: Heavy Equipment Wash Rack Oil/Water Separator (OWS)
Indoor/Outdoor: Outdoor
Type, Function, and History: SWMU D-09 was identified as an oil/water separator that received wash water from the heavy equipment wash rack at Building 1119 (SWMU C-10). The oil/water separator and wash rack located next to Building 1119 no longer exist. There were no historical records indicating that any type of release or impact to the nearby environment had occurred at this site.
Status: Administrative Closure (AC)
Level of Closure: UU/UE
Regulatory Approval: 07/06/2012
Statement of Basis: 10/20/2014
Residual COCs (if applicable): N/A
LUCs (if applicable): N/A

10. ***SWMU ID:*** F-02
SWMU Name: Above Ground Storage Tank (AST) Waste POL Storage Area
Indoor/Outdoor: Outdoor
Type, Function, and History: SWMU F-02 was identified as an above ground storage tank (AST) located at Building 190 which was used from 1978 to 1990. Closure activities at SWMU F-02 began in 1997 and included the removal of tank contents and tank decontamination. Fort Belvoir submitted the closure report to the VDEQ in February 1998, requesting No Further Action. VDEQ approved this recommendation in a letter dated May 21, 1999.
Status: No Further Action (NFA)
Level of Closure: UU/UE
Regulatory Approval: 09/21/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable):

Soil: arsenic (5.87 mg/kg)

LUCs (if applicable): N/A

11. ***SWMU ID:*** G-08

SWMU Name: Building 1146 UST Waste POL Storage Area

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU G-08 was identified as a 275-gallon UST, located approximately 20 feet northwest of Building 1146 that managed waste automotive POLs. Closure activities began for SWMU G-08 in 1997. The closure report was submitted to VDEQ in February 1998, recommending No Further Action. VDEQ approved this recommendation in a letter dated May 21, 1999.

Status: No Further Action (NFA)

Level of Closure: UU/UE

Regulatory Approval: 09/21/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable):

Soil: arsenic (5.19 mg/kg**)**

LUCs (if applicable): N/A

12. ***SWMU ID:*** G-10

SWMU Name: UST Waste POL Storage Area

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU G-10 was identified as a 2,500-gallon UST used for the storage of waste oils on the north side of Building 1116. Approximately 600 cubic yards of soil, associated with this UST, was sampled, characterized, and disposed of as non- hazardous petroleum-contaminated waste. The closure report was submitted to VDEQ in February 1998 that recommended No Further Action. A VDEQ letter dated May 21, 1999 affirmed that clean closure had been achieved for soils at the site.

Status: No Further Action (NFA)

Level of Closure: UU/UE

Regulatory Approval: 09/21/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable): N/A

LUCs (if applicable): N/A

13. ***SWMU ID:*** H-02

SWMU Name: Building 1146 Battery Storage Area

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU H-02 was identified as a 30-square foot concrete area used for storing discarded automobile batteries located at Building 1146. A Phase I RFI was performed at SWMU H-02 in December 2008. Field activities included the collection of two surface soil samples (0-2 ft bgs) and two subsurface soil samples (2-4ft bgs) from the area

surrounding Building1146's storage area. Based on the conclusions of this investigation Fort Belvoir recommended no further action at SWMU H-02.

Status: No Further Action (NFA)

Level of Closure: UU/UE

Regulatory Approval: 07/30/2010

Statement of Basis: 10/20/2014

Residual COCs (if applicable):

Soil: arsenic (7.6 mg/kg)

LUCs (if applicable): N/A

14. ***SWMU ID:*** H-05

SWMU Name: Building 1116 Battery Storage Area

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU H-05 was identified as an open area used for the storage of used vehicle batteries in the southwest corner of Building 1116. A Phase I RFI was performed at SWMU H-05 in December 2008. Field Activities included the collection of two soil samples from within the vicinity of the former storage rack (20 ft east of building 1117). Based on the conclusions of this investigation, Fort Belvoir recommended No Further Action at SWMU H-05. NFA was approved by US EPA Region 3 for all land use scenarios; thus, no land use controls are required.

Status: No Further Action (NFA)

Level of Closure: UU/UE

Regulatory Approval: 01/09/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable):

Soil: arsenic (5.3 mg/kg)

LUCs (if applicable): N/A

15. ***SWMU ID:*** I-04

SWMU Name: Battery Acid Neutralization Pit

Indoor/Outdoor: Indoor

Type, Function, and History: SWMU I-04 was identified as a battery acid neutralization unit located inside Building 707. SWMU I-04 consisted of a 55 gallon drum to which acidic solutions were added and the basic solutions were used to neutralize the liquid for subsequent discharge to the sanitary sewer. The neutralization tank, sump tanks, sludge barrel, epoxy-coated floor, and ancillary equipment were removed, decontaminated, and disposed of as non-hazardous solid waste. A residential health-based risk assessment including fate and transport modeling was performed using the maximum concentration of the analytes detected in the final closure samples. The risk assessment concluded that the site did not pose an unacceptable risk. Fort Belvoir submitted a closure report recommending No Further Action to VDEQ in January 1998. VDEQ approved this recommendation in a letter dated May 21, 1999.

Status: No Further Action (NFA)

Level of Closure: UU/UE

Regulatory Approval: 09/21/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable):

Soil: arsenic (6.89 mg/kg), barium (73.6 mg/kg), cadmium (0.270 mg/kg), chromium (30.1 mg/kg), lead (45.3 mg/kg), mercury (0.052 mg/kg), selenium (1.06 mg/kg), silver (0.689 mg/kg)

LUCs (if applicable): N/A

16. ***SWMU ID:*** L-07

SWMU Name: Building T1125 Bulk Diesel Pump Station

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU L-07 was identified as an outdoor area and cinder block building (Building 1125) that contained a pump to transfer diesel fuel from two 12,000-gallon USTs to a fill stand with a loading arm located approximately 50 feet south of the pump house. Final closure of the Building T1125 was granted by VDEQ water division in September 1994; and, final site closure for the entire area was granted by VDEQ in a letter dated May 21, 1999.

Additionally, the surrounding area around L-07 has been addressed under a corrective action program for Building 1124, Vehicle Fueling Facility. A pump and treat soil vapor extraction system was designed and constructed to address the hydrocarbons in the soil and groundwater in the vicinity of Building 1124. The Building 1124 petroleum site (PC #1999-3377) received case closure by VDEQ in November 2013.

A large PCE groundwater plume (SWMU MP-2) that was discovered during a stormwater improvement project conducted near Building 1124, Vehicle Fueling Facility is located beneath site L-07. Any residual petroleum contamination remaining in soil or groundwater at SWMU L-07 would be managed under Corrective Measures at SWMU MP-2.

Status: No Further Action (NFA)

Level of Closure: UU/UE

Regulatory Approval: 09/21/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable):

Groundwater: TPH-DRO (17.8 mg/L), TPH-GRO (41.7 mg/L), benzene (3,420 ug/L***)***

LUCs (if applicable): N/A

17. ***SWMU ID:*** L-10

SWMU Name: Building 1222 Bay

Indoor/Outdoor: Indoor

Type, Function, and History: SWMU L-10 was identified as an area inside Building T1122 where eight 55-gallon drums were being stored. Building T1122 and the former oily water storage area were demolished in 1994 to 1995. Historical records for SWMU L-10 indicated that there were no documented releases or spills of hazardous materials to the environment related to this unit. Additionally since SWMU L-10 was located indoors there would be no impacts to the surrounding environment.

Status: Administrative Closure (AC)

Level of Closure: UU/UE

Regulatory Approval: 07/06/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable): N/A

LUCs (if applicable): N/A

18. ***SWMU ID:*** L-23

SWMU Name: Scrap Storage Area

Indoor/Outdoor: Outdoor

Type, Function, and History: This unit was identified as a 2,500-square foot metal scrap staging/storage area located approximately 50 feet north of Building 1116. Review of historical records indicated that no release or spill had occurred at this site. In addition, metal scrap and other materials were no longer stored in the area and no records indicated that hazardous materials were ever stored at the unit..

Status: Administrative Closure (AC)

Level of Closure: UU/UE

Regulatory Approval: 07/06/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable): N/A

LUCs (if applicable): N/A

19. ***SWMU ID:*** L-24

SWMU Name: Former Steam Cleaning Solvent Tanks

Indoor/Outdoor: Outdoor

Type, Function, and History: This unit was identified as three 1,000-gallon above ground storage tanks (ASTs) that stored solvents used at the Building 1119 steam cleaning wash rack (SWMU D-09). The unit was located north of former Building T1118. Review of historical records indicated that no release or spill had occurred at this site. The three ASTs associated with SWMU L- 24 were removed between 1988 and 1992.

Status: Administrative Closure (AC)

Level of Closure: UU/UE

Regulatory Approval: 07/06/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable): N/A

LUCs (if applicable): N/A

20. ***SWMU ID:*** L-34

SWMU Name: Underground Storage Tank (UST) Hazardous Waste Storage Area

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU L-34 was identified as a one-time spill in December 1986 when 3,000 gallons of oil was released into subsurface soils. SWMU L-34 and the surrounding area were addressed through the installation of a remediation system for Building 1124, Vehicle Fueling Facility managed through Fort Belvoir's Petroleum Management Program under the regulatory authority of VDEQ. The Building 1124 petroleum site (PC #1999-3377) received case closure by VDEQ in November 2013. As the site was appropriately managed under Fort Belvoir's Petroleum Management Program, SWMU L-34 received regulatory concurrence from US EPA Region 3 for Administrative Closure.

Status: Administrative Closure (AC)

Level of Closure: Closed under Petroleum Management Program (PMP)

Regulatory Approval: 07/06/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable):

Groundwater: TPH-DRO (17.8 mg/L), TPH-GRO (41.7 mg/L), benzene (3,420 ug/L)

LUCs (if applicable): N/A

21. ***SWMU ID:*** L-36
SWMU Name: Drum Storage Area

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU L-36 was identified as a group of unlabeled 55-gallon drums located adjacent to Building T1120. Review of historical records indicated that no release or spill had occurred at this site.

Status: Administrative Closure (AC)

Level of Closure: UU/UE

Regulatory Approval: 07/06/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable): N/A

LUCs (if applicable): N/A

22. ***SWMU ID:*** L-44

SWMU Name: Pesticide Equipment Wash Pad

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU L-44 was identified as a bare soil area covered with gravel which managed pesticide equipment at Building T1113. In December 2008, a Phase I RFI was performed at SWMU L- 44. Field activities included the collection of six soil samples from three soil borings collected from the area surrounding the former pesticide equipment wash pad. Surface soil samples from the 0-2 ft bgs intervals and subsurface soils from the 2-4 ft bgs intervals were sampled for pesticides. None of the detected concentrations of pesticides at SWMU L-44 exceeded the September 2008 US EPA Region III standards for residential soils. Based on the conclusions of this investigation, Fort Belvoir received approval from regulators for No Further Action at this site.

Status: No Further Action (NFA)

Level of Closure: UU/UE

Regulatory Approval: 06/26/2013

Statement of Basis: 10/20/2014

Residual COCs (if applicable): N/A

LUCs (if applicable): N/A

23. ***SWMU ID:*** MP-2

SWMU Name: Building 1124 PCE Detections

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU MP-2 is located in an industrial area on South Post near Accotink Bay. The need for investigation at this site developed when the presence of PCE in groundwater was discovered in multiple locations throughout the industrial area on South Post.

Groundwater data collected as part of a proposed underground stormwater facility investigation (North Building 1124 Site), an investigation at SWMU-A05, and groundwater monitoring at the Theote Road Debris Landfill (SWMU A-02) revealed PCE contamination in the deep unconfined aquifer.

It was unknown whether the presence of this contamination was from multiple source areas, or whether one major source existed. Furthermore, it is also unknown whether the contamination consisted of small individual plumes, multiple sites, or whether they were connected. As a result, it was determined in the best interest of the Army that all of this information be handled together as one site (MP-2).

In 2014, a multi-phase RFI was conducted at site MP-2. The multi-phase investigation included analysis of PCE contamination of the soil, groundwater, and surface water. In addition, an assessment for potential vapor intrusion in nearby buildings was completed by performing soil gas, sub-slab, indoor air, and ambient air sampling and analysis for PCE and related daughter products. Based on the findings in the multi-phase RFI, Fort Belvoir recommended that a Corrective Measures Study be conducted to evaluate potential remedies to treat PCE contamination at MP-2. The Army has also proposed conducting additional vapor intrusion sampling of the nearby buildings to collect data for the warm season.

Status: Corrective Measure Study (CMS)

Level of Closure: **Active**

Regulatory Approval: N/A

Statement of Basis: N/A

Residual COCs (if applicable): N/A

Groundwater: PCE (7,410 ug/L), TCE (35 ug/L), benzene (27.7 ug/L), EDB (0.13 ug/L)

LUCs (if applicable): N/A

24. ***SWMU ID:*** MP-9

SWMU Name: Old Dump

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU MP-9 was discovered in summer 2010. The site is north of a steep ravine and opposite of SWMU A-05. Aerial photography from 1974 to 1979 shows the area east of MP-9 as an automotive junk yard and a 1982 general site map shows the property as a motor repair shop. Scrap materials were dumped over the side of the slope and included automotive parts, old tanks, and old piping and tubing.

Dumping was confirmed during an RFI scoping site visit conducted in September 2013 where vehicle parts consisting of wheels, fenders, hoods and tanks were observed on steep side slopes and in drainage channels at the site. The on-site inspection also located surface debris including wires, optical cables, barbed wire, plastic, rebar, bottles, drums, car parts, and tires. A tank and multiple drums were found to have been opened or rusted out beyond the ability to contain liquids. Based on a review of historical information, it is apparent that dumping in the wooded area of MP-9 occurred between 1962 and 1983.

Following the 2013 site inspection, a magnetic imaging survey was conducted at MP-9 in September 2014 to investigate the extent of buried debris. Shallow subsurface magnetic anomalies were further assessed using Ground Penetrating Radar (GPR). The GPR indicated that the shallow subsurface materials were disturbed and identified anomalies that corresponded to magnetometer detections. Test pits were excavated in January 2015 at the three largest subsurface geophysical anomalies to investigate the nature and vertical extent of buried debris. Debris encountered in the test pits included wood, brick, concrete, and metal debris. A subsurface soil

sample was collected at the bottom of each test pit below and on the topographical low side of any encountered subsurface debris.

In order to determine if site run-off had impacted local sediment, one sediment sample was collected from each of three intermittent surface drainage channels that receive run-off from MP-9. Flowing water was not present in the intermittent surface drainage channels at the time of sample collection, so no surface water samples were collected. Detected concentrations of VOCs and SVOCs in the sediment samples were below the USEPA residential RSLs. Concentrations of aluminum, arsenic, cobalt, iron, and vanadium were detected in one or more sediment samples above the residential standards, all metal concentrations were below the industrial standards.

Based on the analytical results and the physical conditions at MP-9 as observed during the RFI, no unacceptable risks to human health or the environment were identified. The extent of the dump site has been defined and the chemical contamination below industrial standards at MP-9 has been documented. Concentrations of organic compounds and metals (cobalt and vanadium) that exceeded screening criteria in sampled groundwater were attributed to background conditions and to the proximity of the site to ongoing remediation at SWMU A-05. No further action was recommended for MP-9 and NFA was approved by USEPA in July 2015. Because human and ecological receptors are not exposed to subsurface soil or groundwater contamination, the U.S. Army has found negligible risk to human health or the environment at SWMU MP-9.

Status: No Further Action (NFA)

Level of Closure: Industrial

Regulatory Approval: 07/31/2015

Statement of Basis: 03/09/2018 (Decision Document)

Residual COCs (if applicable):

Soil: aluminum (11,000 mg/kg), arsenic(7.9 mg/kg), cobalt (5.5 mg/kg), iron(24,300 mg/kg), lead(464 mg/kg), benzo(a)anthracene (203 ug/kg), benzo(a)pyrene (177 J ug/kg), benzo(b)fluoranthene (188 J ug/kg), dibenzo[a,h]anthracene (27.4J ug/kg)

Sediment: aluminum (11,000 mg/kg), arsenic (2.8 mg/kg), cobalt (3.6 J mg/kg), iron (28,800 mg/kg), vanadium (46.6 mg/kg)

Groundwater: cobalt (3.3 J ug/L), vanadium (27.5 J ug/L), PCE (12,600 J ug/L)

LUCs (if applicable): Documentation of the LUC in the Fort Belvoir GIS system and Master Plan to indicate that waste management plans and health and safety precautions may be needed if land use changes or development of MP-9 is considered; 150-foot buffers will be added in the Fort Belvoir GIS and Master Plan around SWMU MP-9; Signage prohibiting unauthorized dumping and notification of excavation restrictions; Annual inspections will be conducted to ensure that the LUC is effective and operational. Inspection reports will be provided to the VADEQ; Fort Belvoir will notify the State within 60 days, or as soon as possible, if the land use changes in a manner that would significantly impact the integrity of the LUC.

Required Sampling: Based on the presence of two active SWMUs within this drainage outfall, this evaluation determined that it is necessary for Fort Belvoir to monitor and characterize the discharge from RO-015.

5.15.2 RO-015 – SWMU Sample Analysis

A sample was collected at RO-015 on April 24, 2018 for the substances noted in Attachment A, "Water Quality Criteria Monitoring". The sample results for constituents detected above the specified Quantification Level (QL) are summarized in Table 8 below. All exceedances of Water Quality Criteria is highlighted in red. The completed Attachment A and laboratory results are provided in Appendix G-5.

These results were compared to the Virginia Water Quality Criteria (WQC) for surface waters as listed in 9VAC25-260-140. The Freshwater Acute WQC for copper, nickel, and zinc are a function of total hardness as calcium carbonate (CaCO3) mg/L and the Water Effect Ratio (WER). Attachment A does not require reporting of hardness and therefore this information was not collected. Due to hardness not being collected with this round of sampling, the minimum or conservative value of 25 mg/L, The maximum of 100 mg/L, the median of 50 mg/L that was used in the waste load allocation analysis completed by VADEQ in 2015, and the historical average of 68.4 mg/L was used for hardness values, while the WER was assumed to be '1'. Criteria values for the conservative, median, maximum, and average criteria are presented below for comparison. Calculation of WQC for each metal dependent on hardness are presented in Appendix F.

Acute Freshwater WQC was exceeded for Copper but Human Health WQC was not exceeded for any of the detected metals. Although low levels of antimony, arsenic, chromium, nickel, and zinc were detected, no other analyte listed in Attachment A was detected in samples.

Table 8: RO-015 Sample Result Summary

Analytes (Dissolved)	**Freshwater Acute Criteria (ug/L)[1]**				**Human Health (ug/L)**	**Sample Result (ug/L)**
	Conservative[2]	**Average[3]**	**Median[4]**	**Maximum[5]**		
Antimony	–	–	–	–	640	**0.618**
Arsenic	340	–	–	–	–	**2.02**
Chromium III	183.07	417.45	322.96	569.76	–	**3.13**
Chromium VI	16	–	–	–	–	**3.13**
Copper	***3.64***	***9.40***	***6.99***	***13.44***	–	***18.4***
Nickel	56.44	132.25	101.45	182.36	4600	**2.42**
Zinc	36.20	84.94	65.13	117.18	26000	**22.8**

[1] WQC for cadmium, chromium III, copper, lead, nickel, silver, and zinc are a function of total hardness as calcium carbonate (CaCO3) mg/L and the Water Effect Ratio (WER).
[2] WQC calculated based on a conservative or minimum hardness value of 25 mg/L as defined in 9 VAC 25-260-140.
[3] WQC calculated based on the average hardness from historical sampling in 2017 and 2018 at RO-015.
[4] WQC calculated based on the hardness value of 50 mg/L used by VADEQ in 2015 when running a Wasteload Allocation Analysis in April 2015 based on OWP Guidance Memorandum 00-2011.
[5] WQC calculated based on a maximum hardness value of 100 mg/L as defined in 9 VAC 25-260-140.
Bold sample result indicates exceedance of one or more Water Quality Criteria.
Bold WQC that was exceeded based on results

Legend

- RO 016
- SWMU Point - Status: Closed
- Drainage Area RO 016
- Waterway

N

Representative Outfalls 016

0 0.0050.01 0.02 Miles

SES Construction and Fuel Services LLC

5.16 RO-016 – DOGUE CREEK MARINA

The drainage area for Representative Outfall 016 (RO-016) is located near the eastern border of Fort Belvoir and encompasses part of the marina located at the mouth of Dogue Creek. The RO-016 is a drain outlet located on the western most point of the drainage area approximately 20 meters west of Building 1696. Building 1696 is the only building located within the drainage area and houses a maintenance bay.

The outfall receives sheet flow run-off from a paved road in the northern part of the drainage area used to access Building 1696 and the watercraft parking/storage area made of gravel substrate. Stormwater run-off flows from the eastern and northeastern portion of the drainage area to the west, first entering a vegetated drainage ditch approximately 15 feet southeast of Building 1696 before entering a pipe culvert directing the flow under the road and into Dogue Creek.

5.16.1 RO-016 – SWMU Evaluation

As shown on the drainage map for RO-016, two SWMUs – F-03 and N-17 - are located within the drainage area of this outfall. Soil sampling was conducted at both SWMUs, and both have been approved for No Further Action (NFA) UU/UE. These two SWMUs are discussed below.

1. ***SWMU ID:*** F-03

   SWMU Name: Aboveground Storage Tank (AST) Waste POL Storage Area

   Indoor/Outdoor: Outdoor

   Type, Function, and History: SWMU F-03 was identified as a 250-gallon AST that accepted waste POL from marina activities and was actively used starting in 1983. Closure activities were initiated in July 1996 and consisted of disposal of the AST and its contents as well as nearby structures and soil. Final closure samples were collected. Closure sample results indicated the site could be closed with unrestricted land use. Fort Belvoir submitted the closure report to the VDEQ in December 1997 requesting No Further Action. VDEQ approved this recommendation in a letter dated May 21, 1999. The EPA Region 3 RCRA Program approved NFA for all land use scenarios in a letter dated September 21, 2012; thus, no land use controls are required.

   Status: No Further Action (NFA)

   Level of Closure: UU/UE

   Regulatory Approval: 09/21/2012

   Statement of Basis: 10/20/2014

   Residual COCs (if applicable):

   Soil: chromium (16.9 mg/kg)

   LUCs (if applicable): N/A

2. ***SWMU ID:*** N-17

   SWMU Name: Marina Battery Storage Area

   Indoor/Outdoor: Outdoor

   Type, Function, and History: SWMU N-17 was first identified as a SWMU during the 1992 CH2M Hill SWMU Study. The unit reportedly managed spent batteries that were turned in when the marina purchased new batteries. According to the 1992 study, the batteries were normally stored on a pallet in a fenced area. When enough batteries accumulated they were reportedly removed from the site. There was no release observed during the 1992 study. The start-up date was unknown but at the time of the study, the unit was active and had no closure plans.

According to the 1997 SWMU Action Plan, the site became inactive sometime between the 1992 and 1997 studies. The inactive unit was reported to be located immediately west of Building T-1697 and 80 feet northeast of Building 1696. The unit consisted of a bare ground storage area separated from the main marina yard by a wooden fence. A facility representative indicated that there was no specific location inside the 35 feet by 24 feet fenced in area that was specifically dedicated to the storage of spent batteries.

A Phase I RFI was performed at SWMU N-17 in December 2008. Field activities included the collection of three soil samples from the area surrounding the former battery storage area. Surface soil samples from the 0-2 feet bgs interval and subsurface soil samples from the 2-4 feet bgs interval were collected from each boring. The soil samples collected from N-17 were sent to the laboratory for the analysis of metals. Based on the conclusions of this investigation, Fort Belvoir recommended no further action at SWMU N-17.

Status: No Further Action (NFA)

Level of Closure: UU/UE

Regulatory Approval: 01/09/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable):

Soil: arsenic (1.7 mg/kg)

LUCs (if applicable): N/A

Required Sampling: Based on the soil sampling results, NFA UU/UE closures, and absence of active SWMUs, this evaluation indicated that Fort Belvoir is not required to characterize the stormwater runoff at Outfall RO-016 for the substances noted in Attachment A of the permit.

Legend

- RO 017
- Drainage Area RO 017
- Waterway
- SWMU Point - Status: Closed
- SWMU Area - Status: Closed

N

Representative Outfalls 017

0 0.0125 0.025 0.05 Miles

SES Construction and Fuel Services LLC

5.17 RO-017 – RECYCLING AND COMPOST CENTER

The drainage area for Representative Outfall 017 (RO-017) is located on the south post and encompasses a portion of building 1089, the recycling center, and a compost/mulch yard located on the north side of Pohick road. The RO-017 is sampled at a break in an existing berm on the northeastern corner of the berm that surrounds most of the compost yard. Along the eastern/northeastern side of the facility there are about two slope benches, located at descending grades, before reaching the base of the slope near the stream channel. The benches may be part of slope stabilization efforts at the closed landfill. At the berm, at the grade where the mulching and composting activity occurs, is an about five foot gap in the berm that allows stormwater runoff to discharge to the first (highest) slope bench, that is slightly sloped and heavily vegetated, providing a filter strip and likely infiltration capability for stormwater leaving the site. No discharge/surface flows from the facility have been observed during multiple inspections leaving the first slope bench. Therefore, the firsthand observations lead to the conclusion that the flows from the grade where mulching and composting activities occur infiltrate into the soils before seeping out through natural slope seeps at the lower grade, below this bench.

Most of the runoff collected at RO-017 flows to the northeast via sheet flow over the compost yard before channelizing at the break in the berm. This is where samples are usually taken, resulting in substantially higher detections for effluents because the discharge has not yet been treated by the natural vegetation at the slope bench. Moreover, the discharge infiltrates into the soils at the first slope bench from the top, based on multiple observations prior to seeping out of the ground, likely via the two different seeps in near the slope. The first seep discharges just about 200 feet to the east of RO-017, and the second seep discharges along the second slope bench down and then discharges to an unnamed tributary to the Accotink Bay.

The compost/mulch yard sits atop a closed landfill (N-23) and is used for the composting and mulching of yard and leaf waste for reuse throughout the installation. Under 9VAC25-31 and 9VAC25-151 it states that any industrial facility covered under the regulations, including Sector A – Timber Products Facilities, that discharges stormwater through a point source to waters of the state or a storm sewer system must apply for a permit. A ‘point source’ is defined in 9VAC25-31-10 as:

> *“Any discernible, confined, and discrete conveyance including any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel, or other floating craft from which pollutants are or may be discharged.”*

This facility does not have a defined outfall or ‘point source’ that meets this definition and that discharges into a MS4, state waters, or waters of the US (WOUS) due to the ground infiltration that occurs prior to reaching any state waters or WOUS to the northeastern side of the composting and mulching area. Instead the flows infiltrate into the ground on the first bench, continue as groundwater flows before discharging from the ground through slope seeps. Since this portion of the facility does not have a point source discharge that connects via discrete surface water flows to waters of the state, the drainage area to the current outfall location should be removed from the ISW Permit in accordance with the regulations. In addition, the facility operations would be more appropriately managed under the Virginia Solid Waste Regulations 9VAC25-81 for Compost Facilities and potentially as a High Priority Facility, as defined in 9VAC25-890-1, under Fort Belvoir’s General MS4 Permit.

> *“‘High-priority facilities’ means facilities owned or operated by the permittee that actively engage in one or more of the following activities: (i) composting, (ii) equipment storage and maintenance, (iii) materials storage, (iv) pesticide storage, (v) storage for public works, (vi) recycling, (vii) salt storage, (viii) solid waste handling and transfer, and (ix) vehicle storage and maintenance.”*

The recycling facility, building 1089, on the other side of the drainage divide is used for collecting and sorting recyclables that are then transported off the installation for final processing. Discharge from the drainage area at the front portion of the recycling center, where all the collection and sorting of materials occurs does not discharge to RO-017. Instead this drainage area flows leave the site via sheet flow into a grassed swale within a heavily wooded area to the north. In addition, RO-017 is currently permitted under Sector A as a *Timber Products Facility* which is not the appropriate Sector for the activities occurring on-site as no wood is used nor recycled at this portion of the facility.

The activities occurring at the facility require re-characterization as a Material Recovery Facility (MRF) under industrial Sector N, as defined in 9VAC25-151-210, because the facility only receives source separated recyclables from non-industrial and residential areas. The materials received and processed include paper, newspaper, glass, cardboard, plastic containers, and aluminum cans. Therefore, this portion of the facility meets the definition of a MRF, be regulated as such, and the drainage area re-delineated to determine the point of discharge. Sector N – Scrap recycling and Waste Recycling Facilities Fact Sheet and associated regulations are presented in Appendix H.

5.17.1 RO-017 – SWMU Evaluation

As shown on the drainage map for RO-017, three SWMUs – L-18, MP-5, and N-23 – are located within the drainage area of this outfall. As part of the investigations of these SWMUs, soil and groundwater were sampled at SWMU MP-5. Soil, sediment, groundwater, and surface water were sampled at SWMU N-23. MP-5 and N-23 have both been approved for No Further Action (NFA) with Land Use Controls (LUCs). SWMU L-18 is Administratively Closed UU/UE based on a record search. These three SWMUs are discussed below.

1. ***SWMU ID:*** L-18
   SWMU Name: Recycling Center
   Indoor/Outdoor: Indoor
   Type, Function, and History: SWMU L-18 is a cardboard and paper crusher located inside Building 1089, the installation's recycling center. Historical records for SWMU L-18 indicated that there were no documented releases or spills of hazardous materials to the environment related to this unit. As such, SWMU L-18 received regulatory concurrence from US EPA Region 3 for Administrative Closure. The crusher is still in use inside the recycling center today.
   Status: Administrative Closure (AC)
   Level of Closure: UU/UE
   Regulatory Approval: 01/03/2011
   Statement of Basis: 10/20/2014
   Residual COCs (if applicable): N/A
   LUCs (if applicable): N/A

2. ***SWMU ID:*** MP-5
   SWMU Name: Recycling Center Contaminated Soil
   Indoor/Outdoor: Outdoor
   Type, Function, and History: SWMU MP-5 is located off Pohick Road near Building 1089. During construction activities for initial grading of a manhole, a tar-like substance was found. The construction contractor removed impacted soil from the area, took confirmation samples, and backfilled with clean soil. The confirmation samples indicated that contamination was still

present outside of the construction limit of disturbance. In 2014, a Phase I RFI was completed. Based on the results of the RFI and the current and future anticipated land use.

Human and ecological receptors are not exposed to subsurface soil or groundwater at MP-5, therefore, exposure pathways to these media are incomplete. Because the exposure pathways are incomplete, the U.S. Army has found negligible risk to human health or the environment sourced from the detected constituents at MP-5. Present operating conditions at MP-5 are such that there is no likelihood of a future release of hazardous constituents. Concentrations of chromium, lead, and thallium that slightly exceeded screening criteria in sampled groundwater were attributed to sample turbidity associated with grab sampling from an undeveloped temporary well placement. Because impacted soil has been removed and the site does not pose a threat to human health or the environment, no further action was recommended for MP-5.

Status: No Further Action (NFA)

Level of Closure: Industrial

Regulatory Approval: 07/31/2015

Statement of Basis: 03/09/2018

Residual COCs (if applicable):

Soil: aluminum (11,000 mg/kg), arsenic (4.5 mg/kg), cobalt (7.2 mg/kg), iron (16,000 mg/kg), manganese (250 mg/kg), benzo(a)pyrene (230 ug/kg),benzo(b)fluoranthene (280 ug/kg), dibenz[a,h]anthracene (53 ug/kg), indeno[1,2,3-cd]pyrene (160 ug/kg)

Groundwater: chromium (170 ug/L), lead (28 ug/L), thallium (3.6 J ug/L)

LUCs (if applicable): Documentation of the LUC in the Fort Belvoir GIS system and Master Plan as a former SWMU site area indicating that waste management plans and health and safety precautions may be needed if development in this area is considered.

3. ***SWMU ID:*** N-23

SWMU Name: Post Dump

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU N-23, referred to as the Old Post Dump, is an inactive landfill located northeast of Building 1089 (recycling center). The landfill was identified in a 1992 study via review of aerial photography from July 7, 1943, it is unknown what wastes were collected at the site. Phase I and Phase II RFIs were conducted at the site and included the review of historical records and aerial photographs, landfill delineation by test pit investigations, soil borings, groundwater monitoring well installations, surface water and sediment sampling, and landfill gas (LFG) probe installations and monitoring.

A series of five (5) test pits were excavated around the perimeter of SWMU N-23 to delineate the horizontal extent of buried waste at the site. This effort identified soils consisting of silts and sands to clays, with non-native soils as a landfill cap. Wastes encountered at the site consisted of construction and miscellaneous waste including glass, metal, wood, and plastic debris. No unusual odors or soil staining were noted in test pit investigations performed outside the delineated limits of waste. The waste encountered during the test pit investigations was used to define the landfill's horizontal limits.

Based on the findings of the Phase I and Phase II RFI, no indications of significant releases were identified, with the exception of select metals (manganese, cobalt, and thallium) in groundwater and PAHs in groundwater at a single monitoring well location downgradient of the landfill. These compounds/analytes reported in the groundwater are only slightly higher than regional background concentrations and are limited in extent. Based on the results of these investigations, EPA Region 3 approved No Further Action in a letter dated January 23, 2013. However,

industrial use LUCs were recommended to limit development at the site due to existing landfill debris.

Status: No Further Action (NFA)

Level of Closure: Industrial

Regulatory Approval: 01/23/2013

Statement of Basis: 10/20/2014

Residual COCs (if applicable):

Soil: aluminum (11,840 mg/kg), antimony (3.3 mg/kg), arsenic (7.4 mg/kg), cobalt (6.8 mg/kg), iron (18,000 mg/kg), manganese (313 mg/kg), benzo(a)pyrene (29 ug/kg)

Sediment: benzo(a)pyrene (235 ug/kg)

Groundwater: benzo(a)pyrene (0.80 ug/L), bis(2-ethylhexyl) phthalate (6.5 ug/L)

Surface Water: benzo(a)pyrene (0.21 ug/L), benzo(k)fluoranthene (0.28 ug/L), chrysene (0.18J ug/L), dibenz(a,h)anthracene (0.33 ug/L), indeno(1,2,3-cd)pyrene (0.35 ug/L), heptachlor (0.082J ug/L)

LUCs (if applicable): Signs to identify the boundaries of known buried waste, warn of the potential hazards, and notify of excavation restrictions; Excavation restrictions and notifications to be implemented through the existing excavation permitting process for the landfill extents and a 150-foot safety notification buffer for construction workers adjacent to the landfill; Notations in Master Plan that future land use and construction for the landfill needs to be consistent with protection of human health and the environment; Landfill Cap Inspections performed annually to ensure the integrity of the landfill caps; Record Keeping procedures to include regular reporting of the results of inspections.

Required Sampling: Based on the sampling results, AC and NFA closures, and absence of active SWMUs, this evaluation indicated that Fort Belvoir is not required to characterize the stormwater runoff at Outfall RO-017 for the substances noted in Attachment A of the permit.

Legend

- RO 019
- SWMU Point - Status: Closed
- Drainage Area RO 019
- Waterway

N

Representative Outfalls 019

0 0.01 0.02 0.04 Miles

SES Construction and Fuel Services LLC

5.18 RO-019 – NVESD NORTH

The drainage area for Representative Outfall 019 (RO-019) is located in the southeastern region of Fort Belvoir. The outfall is located to the east of Totten Road approximately 500 feet south of Putnam Road at the end of a rip rap channel. The drainage area for RO-019 encompasses an undeveloped forested area along Totten Road, paved parking areas, a cafeteria, a wood shop, and outdoor storage and maintenance facility.

Most of the stormwater run-off to RO-019 is conveyed via sheet flow from the individual buildings to stormwater pipes. The pipes then discharge to either the rip-rap channel on the east side of Totten road or a grassed swale on the west side of the road before crossing a culvert to RO-019. Generally stormwater moves across the drainage area from the northwest to the southeast before converging at the outfall.

The outfall discharges to an unnamed stream which flows southeast and empties into Ponton Basin then to Gunston Cove. A stream restoration project is currently in the design phase and once completed RO-019 will be a junction box at approximately the same location.

5.18.1 RO-019 – SWMU Evaluation

As shown on the drainage map for RO-019, eight SWMUs are located within the drainage area of this outfall. These SWMUs are B-11, B-12, E-11, G-04, I-02, L-06, L-33, and N-22. Two SWMUs have been approved for No Further Action with Land Use Controls, one SWMU is approved for No Further Action UU/UE, and five SWMUs are Administratively Closed UU/UE. Soil sampling was conducted as part of the investigations of three SWMUs. These eight SWMUs are discussed below.

1. ***SWMU ID:*** B-11
   SWMU Name: Hazardous Waste Storage Area
   Indoor/Outdoor: Indoor
   Type, Function, and History: SWMU B-11 was identified as a three-room cinderblock building, known as Building 317A, used for storage of waste solvents, acids, and gas cylinders generated by various laboratories and departments. Only one room was used for the storage of the hazardous materials. The 1988 Phase II RFA indicted that there were no documented releases of spills related to the site and all waste materials were removed from Building 317's storage room in 1988. According to the VSI, Building 317 was demolished in the mid-1990s and a parking lot is now located on-site. Historical records for SWMU B-11 indicated that there were no documented releases or spills related to the storage of the hazardous materials in Building 317A. As such, SWMU B-11 received regulatory concurrence from US EPA Region 3 for Administrative Closure.
   Status: Administrative Closure (AC)
   Level of Closure: UU/UE
   Regulatory Approval: 07/06/2012
   Statement of Basis: 10/20/2014
   Residual COCs (if applicable): N/A
   LUCs (if applicable): N/A

2. ***SWMU ID:*** B-12
   SWMU Name: Building 327C Hazardous Waste Storage Area
   Indoor/Outdoor: Indoor

Type, Function, and History: SWMU B-12 was identified as a 12 foot by 12-foot cinderblock structure, known as Building 327C, used for storing hazardous materials. Historical records for SWMU B-12 indicated that there were no documented releases or spills to the environment related to the storage of the hazardous materials at this unit. Building 327C was demolished sometime during 1988. As such, SWMU B-12 received regulatory concurrence from US EPA Region 3 for Administrative Closure. Note this historical SWMU is not shown on the map because it was indoors, the building no longer exists, and there was no direct drainage to RO-019.

Status: Administrative Closure (AC)

Level of Closure: UU/UE

Regulatory Approval: 07/06/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable): N/A

LUCs (if applicable): N/A

3. ***SWMU ID:*** E-11
SWMU Name: Building 331 Indoor Waste POL Storage Area

Indoor/Outdoor: Indoor

Type, Function, and History: SWMU E-11 was identified as a six foot by twenty-foot concrete room where waste POL generated by activities at Building 331 was stored. Historical records for SWMU E-11 indicated that there were no documented releases or spills of hazardous materials to the environment related to this unit. As such, SWMU E-11 received concurrence from US EPA Region 3 for Administrative Closure. Note this historical SWMU is not shown on the map because it was indoors and there was no direct drainage to RO-019.

Status: Administrative Closure (AC)

Level of Closure: UU/UE

Regulatory Approval: 07/06/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable): N/A

LUCs (if applicable): N/A

4. ***SWMU ID:*** G-04

SWMU Name: Building 322 UST Waste POL Storage Area

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU G-04 was identified as a 275-gallon UST located adjacent to Building 322. Closure activities for SWMU G-04 were initiated in 1996. According to information within the closure report the tank was installed in 1958 and was removed in 1993 by Douglass Environmental Services. The tank removal report documented the observance of visibly stained soils but no free product. The tank excavation measured 8.5 feet by 7 feet. The remediation contractor collected four background samples and four final closure samples.

A statistical comparison was performed between the concentration of analytes detected in the background samples and analytes detected in the final closure samples. The comparison indicated that the concentrations of lead and chromium were statistically significant when compared to the background concentrations of these analytes. A subsequent health-based risk assessment concluded that the site qualified for unrestricted closure under residential use scenarios. A closure report was submitted to VADEQ in November 1998, recommending no further action. VADEQ approved this recommendation in a letter dated May 21, 1999.

Status: No Further Action (NFA)

Level of Closure: UU/UE

Regulatory Approval: 09/21/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable):

Soil: chromium (21.5 mg/kg), lead (10.8 mg/kg)

LUCs (if applicable): N/A

5. ***SWMU ID:*** I-02

SWMU Name: Building 317 Acid Neutralization Pit

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU I-02 was identified as an active acid neutralization pit located on the western side of Building 317. The pit consisted of a 5ft by 5ft concrete box filled with limestone. The 1993 Action Plan confirmed the unit became active in 1978 and de-activated in 1990. It also stated that wastewater from the Hydrogen Fluoride Scrubber System (SWMU L-06) drained into the pit before being discharged into the sewer system.

In September 2008, a Phase I RFI was performed and field activities included the collection of four soil samples and one field duplicate from two soil borings. The soil boring samples were analyzed for volatiles, semivolatiles, metals, and pH levels. A benzo(a)pyrene concentration of 85.5 mg/Kg exceeded the corresponding residential soil RBC of 22 mg/Kg in the soil sample I02-SB01(8-10ft). However, this detection of benzo(a)pyrene was significantly below the industrial RBC of 320 mg/Kg and therefore was not considered significant. Arsenic was detected in soil, although above residential screening levels, was found to be below Fort Belvoir background levels. This indicated the former activities at SWMU I-02 have not impacted the soils in the vicinity of SWMU I-02.

Based on the conclusions of the RFI investigation and on current and anticipated land use, EPA Region 3 approved No Further Action in January 2012. In order to ensure continued compliance with this NFA determination, Fort Belvoir will implement industrial land use controls to address the benzo(a)pyrene detected above the residential screening levels in soil.

Status: No Further Action (NFA)

Level of Closure: Industrial

Regulatory Approval: 01/09/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable):

Soil: arsenic (5.8 mg/kg), benzo(a)pyrene (85 ug/kg)

LUCs (if applicable): Activity Hazard Analysis required

6. ***SWMU ID:*** L-06

SWMU Name: Building 317 HF Scrubber System

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU L-06 was identified as a wet scrubber, located on top of Building 317, used for neutralizing gases that contained hydrogen fluoride. All materials that were collected, drained into a limestone neutralization pit (SWMU I-02) located on the side of Building 317, which was investigated in 2008. SWMU L-06 was inactive beginning in 1988, and the unit was removed in 1993. Results indicated that no release of hazardous materials/

constituents occurred from this unit. As such, SWMU L-06 received regulatory concurrence from US EPA Region 3 for Administrative Closure.

Status: Administrative Closure (AC)

Level of Closure: UU/UE

Regulatory Approval: 07/06/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable): N/A

LUCs (if applicable): N/A

7. ***SWMU ID:*** L-33

   SWMU Name: Building 326 Oil Spill Ditch

   Indoor/Outdoor: Outdoor

   Type, Function, and History: SWMU L-33 was identified as a one-time release occurring in March 1986, when a ruptured oil line released approximately 600 gallons of turbine lubricating oil into a drainage ditch located at Building 326. After the spill had occurred absorbent pads were placed on top of the concrete pad and drainage ditch, but no information exists on the volume of material recovered. SWMU L-33 is located behind the

   A Phase I RFI was performed at SWMU L-33 in September 2008. Field activities included the collection of three subsurface soil samples and one field duplicate sample from the 4ft to 6ft bgs interval that were analyzed for VOCs, SVOCs, and metals. None of the detected concentrations of VOCs and SVOCs in the soil samples collected at SWMU L-33 exceeded their corresponding US EPA residential and/or industrial RBC soil ingestion values. One vanadium concentration detected in soil sample (4-6ft) at 82.5 mg/Kg slightly exceeded the corresponding residential RBC of 78 mg/Kg. However, this single vanadium exceedance is significantly below the industrial RBC of 1,000 mg/Kg and therefore is not considered significant. Arsenic was also detected above residential screening levels but is within Fort Belvoir background levels.

   Based on the conclusions of this investigation, Fort Belvoir recommended no further action was necessary at SWMU L-33. The US EPA concurred with the recommendation in a letter dated January 9, 2012. A land use control implementation plan will be developed to address the vanadium detected above the residential screening levels.

   Status: No Further Action (NFA)

   Level of Closure: Industrial

   Regulatory Approval: 01/09/2012

   Statement of Basis: 10/20/2014

   Residual COCs (if applicable):

   Soil: arsenic (13.8 mg/kg), vanadium (82.5 mg/kg)

   LUCs (if applicable): Activity Hazard Analysis required

8. ***SWMU ID:*** N-22

   SWMU Name: Waste POL Storage Area

   Indoor/Outdoor: Outdoor

   Type, Function, and History: SWMU N-22 was identified as a concrete pad used to manage POL from adjacent Building 326. Review of historical records indicated that no release or spill had occurred at the site. Soil analytical data collected from a Phase I RFI for nearby SWMU L-33 indicated that no release to the environment had occurred at SWMU L-33 or in the vicinity of

SWMU N-22. The site is still actively used as a POL storage area that is properly maintained as a satellite accumulation area (SAA) with secondary containment. As such, SWMU N-22 received regulatory concurrence from US EPA Region 3 for Administrative Closure because it did not meet the definition of a SWMU.

Status: Administrative Closure (AC)

Level of Closure: UU/UE

Regulatory Approval: 07/06/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable): N/A

LUCs (if applicable): N/A

Required Sampling: Based on the sampling results, record searches, UU/UE closures, and absence of active SWMUs, this evaluation indicated that Fort Belvoir is not required to characterize the stormwater runoff at Outfall RO-019 for the substances noted in Attachment A of the permit.

Legend

- RO 020
- SWMU Point - Status: Closed
- Drainage Area RO 020
- Waterway

N

Representative Outfalls 020

0 0.01 0.02 0.04 Miles

SES Construction and Fuel Services LLC

5.19 RO-020 – NVESD CENTER

The drainage area for Representative Outfall 020 (RO-020) is located in the southeastern region of Fort Belvoir. The outfall is the outlet of a concrete pipe that crosses Totten road at the bottom of a steep hill behind building 362. The drainage area for RO-020 encompasses an undeveloped forested area along a hill off of Totten Road, paved parking areas, research and development labs, and outdoor storage and fueling facilities. Buildings 324, 362, and 7362 are all within the direct drainage area for RO-020.

Most of the stormwater run-off received at RO-020 is conveyed through a small ephemeral stream that receives sheet flow run-off either directly from the buildings or from the stormwater pond that services portions of buildings 362 and 324.

Generally stormwater moves across the drainage area from the west to the east down steep hills concentrating in intermittent and ephemeral stream systems and bisecting a palustrine forested (PFO) wetland. The flow then crosses Totten Road and discharges at the outfall. The outfall discharges to an unnamed stream which flows southeast and empties into Ponton Basin then to Gunston Cove. A stream restoration project is currently in the design phase for the unnamed stream.

5.19.1 RO-020 – SWMU Evaluation

As shown on the drainage map for RO-020, ten SWMUs are located within the drainage area of RO-020. These SWMUs are B-13, D-03, D-04, D-05, E-05, G-05, G-06, H-03, J-02, and N-21. Four SWMUs are Belvoir's PMP as part of an area known as the "Building 324 Tank Farm", three SWMUs are No Further Action UU/UE, and three SWMUs are Administratively Closed UU/UE. The ten SWMUs within this drainage outfall are discussed below.

The Building 324 Tank Farm consisted of ten USTs that were installed in the 1940s and were removed in 1996. Remediation at the site has included the removal and proper disposal of 2,200 cubic yards of petroleum-impacted soil, and installation and operation of an Air Sparge /Soil Vapor Extraction (AS/SVE) system and a Dual Phase Extraction (DPE) system, which were installed in 1999. The DPE system was shut down in 2007, and the AS/SVE system was shut down in 2012. Quarterly groundwater monitoring has been ongoing and based on resulting data it was determined that the systems would need to be turned back on. Remediation of any residual hydrocarbon contamination within the vicinity was addressed through operation of the remediation systems.

1. ***SWMU ID:*** B-13

   SWMU Name: Building 362A Hazardous Waste Storage Area

   Indoor/Outdoor: Indoor

   Type, Function, and History: SWMU B-13 was identified as a 40 foot by 12 foot cinderblock building, known as Building 326A that provided storage for hazardous materials. Historical records for SWMU B-13 indicated that there were no documented releases or spills to the environment related to the storage of the hazardous materials. As such, SWMU B-13 received regulatory concurrence from US EPA Region 3 for Administrative Closure.

   Status: Administrative Closure (AC)

   Level of Closure: UU/UE

   Regulatory Approval: 07/06/2012

   Statement of Basis: 10/20/2014

   Residual COCs (if applicable): N/A

   LUCs (if applicable): N/A

2. ***SWMU ID:*** D-03

SWMU Name: Building 324 Oil Water Separator-1

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU D-03 is located south of Building 324 and adjoining "fuel tank farm". The RFA identified the unit as a single stage oil/water separator unit, constructed of concrete that became operational in 1976. SWMU D-03 is one of three similar oil/water separators found in the area and was identified as a structure measuring 7 feet by 4 feet with a depth of greater than 4 feet. The unit was noted to be the western-most site of the three former separators. The units received oily wastewater from Building 324 and runoff from the tank farm. The treated water was reportedly discharged to the sanitary sewer system and the recovered oil was managed in the separator and removed on an as-needed basis.

According to the Fort Belvoir Installation Action Plan for Building 324/325 Tank Farm, the entire area, which encompasses SWMU D-03, ten USTs and their components as well as 2,200 cubic yards of soil were removed. A three zone soil vapor extraction (SVE) system was installed in 1999 to remediate the remaining petroleum contaminants from the soil and groundwater. The SVE system removed 10.65 tons of hydrocarbons from the site. In 2002 a dual phase extraction (DPE) system was constructed at the site. Over 1,644 gallons of free product was removed between April 2002 and March 2008.

The oil/water separator associated with this site has been removed and the pump and treat system located in the vicinity of the SWMU, was active from 1999 to 2006. The system was constructed to remove analytes associated with petroleum in the soil and groundwater released "Tank Farm at Building 324". The site is currently being managed through a long term monitoring program under the Petroleum Management Program. Any contaminants associated with the former oil/water separator would have been remediated/monitored through these different phases. The site and surrounding area is currently being addressed under a long term monitoring program.

Status: Administrative Closure (AC)

Level of Closure: Managed under Petroleum Management Program (PMP)

Regulatory Approval: 01/03/2011

Statement of Basis: 10/20/2014

Residual COCs (if applicable):

> ***Groundwater:*** benzene (ave. 134 ug/L; max. 1,300 ug/L), ethylbenzene (ave. 115 ug/L; max. 750 ug/L), total xylenes (ave. 273 ug/L; max. 2,000 ug/L), naphthalene (ave. 31 ug/L; max. 190 ug/L)
>
> ***Surface Water:*** benzene (ave. 16 ug/L; max. 86 ug/L), toluene (ave. 34 ug/L; max. 290 ug/L), ethylbenzene (ave. 31 ug/L; max. 180 ug/L), total xylenes (ave. 134 ug/L; max. 930 ug/L), naphthalene (ave. 11 ug/L; max. 59 ug/L)

LUCs (if applicable): N/A

3. ***SWMU ID:*** D-04

SWMU Name: Building 324 Oil Water Separator-2

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU D-04 is located south of Building 324 and adjoining "fuel tank farm". The RFA identified the unit as a single stage oil/water separator unit, constructed of concrete that became operational in 1976. SWMU D-04 is one of three similar oil/water separators found in the area and was identified as a structure measuring 7 feet by 4 feet with a depth of greater than 4 feet. The unit was noted to be the center one of the three former separators. The units received oily wastewater from Building 324 and runoff from the tank farm.

The treated water was reportedly discharged to the sanitary sewer system and the recovered oil was managed in the separator and removed on an as-needed basis.

According to the Fort Belvoir Installation Action Plan for Building 324/325 Tank Farm, the entire area, which encompasses SWMU D-04, ten USTs and their components as well as 2,200 cubic yards of soil were removed. A three zone soil vapor extraction (SVE) system was installed in 1999 to remediate the remaining petroleum contaminants from the soil and groundwater. The SVE system removed 10.65 tons of hydrocarbons from the site. In 2002 a dual phase extraction (DPE) system was constructed at the site. Over 1,644 gallons of free product was removed between April 2002 and March 2008.

The oil/water separator associated with this site has been removed and the pump and treat system located in the vicinity of the SWMU, was active from 1999 to 2006. The system was constructed to remove analytes associated with petroleum in the soil and groundwater released “Tank Farm at Building 324”. The site is currently being managed through a long term monitoring program under the Petroleum Management Program. Any contaminants associated with the former oil/water separator would have been remediated/monitored through these different phases. The site and surrounding area is currently being addressed under a long term monitoring program.

Status: Administrative Closure (AC)

Level of Closure: Managed under Petroleum Management Program (PMP)

Regulatory Approval: 01/03/2011

Statement of Basis: 10/20/2014

Residual COCs (if applicable): N/A

LUCs (if applicable): N/A

4. ***SWMU ID:*** D-05

   SWMU Name: Building 324 Oil Water Separator-3

   Indoor/Outdoor: Outdoor

   Type, Function, and History: SWMU D-05 was identified as an oil/water separator located 20 feet north of Building 324's fenced storage area near the "fuel tank farm" site in the 300 area. The concrete oil water separator measured 7feet by 4feet by 4feet. The treated water discharged into an unnamed swale that flowed towards the south. The unit became operational in 1976 and was reportedly deactivated in 1990. During the inspection the unit was found to still contain an oil/water/sludge mixture approximately 3 inches below the outflow pipe.

   During the 2005 VSI, no visible evidence of stained soil, stressed vegetation, unusual odors, or other indicators of contamination were observed at the former site. A fenced in storage pad located south of the former site used to store small diesel generators and old air conditioners was also observed. A large grass area north of the former site is used for storage of ten (10) large diesel generators. Deciduous forest land is located west of the former site.

   The Closure Report for SWMU G-05 stated that the oil/water separator (SWMU D-05) and UST (SWMU

   G-05) were removed in January through February 1995; the contents, UST and oil/water separator were characterized and disposed of as hazardous waste. Fifty one cubic yards of soil were characterized and disposed of as hazardous waste, as well as 481 cubic yards of soil that were characterized and disposed of as non-hazardous waste. Thirteen final closure soil samples were taken from the area. The current site is part of a larger area known as “Building 324 Tank Farm” that has groundwater which has been impacted by petroleum. According to the VSI, the oil water separator (SWMU D-05) was closed along with nearby waste oil UST through a RCRA closure.

Status: No Further Action (NFA)

Level of Closure: Managed under Petroleum Management Program (PMP)

Regulatory Approval: 09/21/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable): N/A

LUCs (if applicable): N/A

5. ***SWMU ID:*** E-05

   SWMU Name: Building 324 Waste POL Storage Area

   Indoor/Outdoor: Outdoor

   Type, Function, and History: SWMU E-05 was identified as a 20 foot by 10 foot raised concrete pad, located at Building 324, used for managing used oil. The SWMU is being managed under Fort Belvoir's Petroleum Management Program (PMP) for Building 324. Any impacts from SWMU E-05 will be managed under this remediation program. As such, SWMU E- 05 received regulatory concurrence from US EPA Region 3 for Administrative Closure. As part of the Building 324 remediation, 10 USTs were removed in 1996, 2,200 cubic yards of petroleum-impacted soil were removed and properly disposed of, and an air sparge system/ soil vapor extraction (AS/SVE) system and dual-phase extraction (DPE) system was installed in 1999. The DPE system was shut down in 2007, and the AS/SVE system was shut down in 2012. Quarterly groundwater monitoring has been ongoing.

   Status: Administrative Closure (AC)

   Level of Closure: Managed under Petroleum Management Program (PMP)

   Regulatory Approval: 07/06/2012

   Statement of Basis: 10/20/2014

   Residual COCs (if applicable): N/A

   LUCs (if applicable): N/A

6. ***SWMU ID:*** G-05

   SWMU Name: Building 324 UST Waste POL Storage Area

   Indoor/Outdoor: Outdoor

   Type, Function, and History: SWMU G-05 was identified as a 500-gallon UST located south of Building 324, which was used to store waste oil and may have also stored waste solvents. The UST was installed prior to 1950 and has not been used since 1989 and passed an integrity test in 1987. Closure activities for SWMU G-05 were initiated in 1995 that included the decontamination, excavation, sampling, containerization, and disposal of the UST and an associated oil/water separator between January 1995 and April 1997. The remediation contractor excavated and disposed of approximately 51 cubic yards of soil as hazardous waste, and approximately 481 cubic yards of soil as non-hazardous waste. The remediation contractor collected four background samples and 13 final closure samples.

   A statistical comparison of the final closure sample analyte concentrations to the background sample was performed. The analysis indicated that the concentration of chromium was significant when compared to background concentrations. A residential health-based risk assessment was performed and concluded that the site did not pose an unacceptable risk. The closure report was sent to VADEQ in January 1998, recommending no further action. VADEQ approved this recommendation in a letter dated May 21, 1999.

   Status: No Further Action (NFA)

Level of Closure: UU/UE

Regulatory Approval: 09/21/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable):

Soil: chromium (41.3 mg/kg)

LUCs (if applicable): N/A

7. ***SWMU ID:*** G-06

SWMU Name: Building 362 UST Waste POL Storage Area

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU G-06 was identified as a Waste POL (Tank No. 362A) located at Building 362, which consisted of a 2,000-gallon metal underground galvanized steel tank that was installed in 1974 and was used to store waste POLs generated by Building 362. The UST was located along the east side of Building 362. Files indicate the tank was operational until it failed a tightness test in October 1987. No records have been identified to assist in estimating the volume of material released.

Closure activities for SWMU G-06 began in January 1993 when Douglass Environmental Services removed the UST. A Site Characterization Study was conducted in April 1994 that evaluated the extent of petroleum hydrocarbons in the soil and groundwater at the site. A partially backfilled trench about 15 feet east of the cooling tower for Building 362 was observed. The site was sparsely covered with trees that appeared to be less than 10 years old at the time. No additional sampling or further assessment at the site was recommended based on the site terrain and limited extent of impacted soil and limited risk of exposure.

Status: No Further Action (NFA)

Level of Closure: UU/UE

Regulatory Approval: 09/21/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable): N/A

LUCs (if applicable): N/A

8. ***SWMU ID:*** H-03

SWMU Name: Former Battery Storage Area

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU H-03 was identified as an area that was used for storing discarded automobile batteries on wooden pallets northeast of Building 324. Historical records for SWMU H-03 indicated the unit became operational around 1986 and that there were no documented releases or spills of hazardous materials to the environment related to the unit. The storage area no longer exists. As such, SWMU H-03 received regulatory concurrence from US EPA Region 3 for Administrative Closure.

Status: Administrative Closure (AC)

Level of Closure: UU/UE

Regulatory Approval: 07/06/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable): N/A

LUCs (if applicable): N/A

9. ***SWMU ID:*** J-02

SWMU Name: Classified Waste Incinerator

Indoor/Outdoor: Indoor

Type, Function, and History: SWMU J-02 was identified as a classified document incinerator that was used between 1979 and 1991. This incinerator was reported to never have received hazardous waste. The incinerator and infrastructure associated with SWMU J-02 were removed in 1991. Historical documentation indicated that there were no impacts to the surrounding environment. As such, SWMU J-02 received regulatory concurrence from US EPA Region 3 for Administrative Closure.

Status: Administrative Closure (AC)

Level of Closure: UU/UE

Regulatory Approval: 07/06/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable): N/A

LUCs (if applicable): N/A

10. ***SWMU ID:*** N-21

SWMU Name: Hazardous Waste Storage Area

Indoor/Outdoor: Indoor

Type, Function, and History: SWMU N-21 was identified as a metal shed on a concrete pad, located behind Building 357 used for storing waste and new raw materials for the night vision research buildings. The unit stored materials and waste on metal racks and segregated the chemicals into rooms for “flammable”, “corrosive”, and “oxidizers”. The unit had been active from the 1960s to 1990s. Based on historical information the contents of each of the three rooms were decontaminated, characterized, and disposed of as non-hazardous waste.

Soil closure samples were collected and included four soil samples from beneath the concrete slab in each room and one from each drainpipe discharge location outside the building. A statistical comparison was performed between the closure samples and site backgrounds samples. The comparisons indicated that there were statistically significant contaminant concentrations of chromium and chloroform.

Subsequently, a residential health-based risk assessment was performed and concluded that the site did not pose an unacceptable risk. The closure report was prepared and submitted in December 1999 to VADEQ, recommending no further action. VADEQ approved this recommendation in a letter dated May 21, 1999. As residual chloroform may be present in soil, a notation will be added to Fort Belvoir’s Master Plan for future management of the site by the Installation.

Status: No Further Action (NFA)

Level of Closure: UU/UE

Regulatory Approval: 09/21/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable):

Soil: chromium (56.2 mg/kg), chloroform (0.00097 mg/kg)

LUCs (if applicable): N/A

Required Sampling: There are no active SWMUs in this outfall drainage area, and therefore, Fort Belvoir is not required to characterize the stormwater runoff at Outfall RO-020 for the substances noted in Attachment A of the permit. However, due to the historical environmental contamination and the ongoing groundwater monitoring at the Building 324 Tank Farm, Fort Belvoir chose to sample RO-020 in order to determine if it is a potential source of stormwater impact.

5.19.2 RO-020 – SWMU Sample Analysis

A sample was collected at RO-015 on April 24, 2018 for the substances noted in Attachment A, "Water Quality Criteria Monitoring". The sample results for constituents detected above the specified Quantification Level (QL) are summarized in Table 9 below. All exceedances of Water Quality Criteria is highlighted in red. The completed Attachment A and laboratory results are provided in Appendix G-6.

These results were compared to the Virginia Water Quality Criteria (WQC) for surface waters as listed in 9VAC25-260-140. The Freshwater Acute WQC for copper, nickel, and zinc are a function of total hardness as calcium carbonate (CaCO3) mg/L and the Water Effect Ratio (WER). Attachment A does not require reporting of hardness and therefore this information was not collected. Due to hardness not being collected with this round of sampling, the minimum or conservative value of 25 mg/L, The maximum of 100 mg/L, the median of 50 mg/L that was used in the waste load allocation analysis completed by VADEQ in 2015, and the historical average of 23.98 mg/L was used for hardness values, while the WER was assumed to be '1'. Criteria values for the conservative, median, maximum, and average criteria are presented below for comparison.

Acute Freshwater and Human Health WQC was not exceeded for any of the detected metals. Although low levels of nickel, and zinc were detected, no other analyte listed in Attachment A was detected in samples.

Table 9: RO-020 Sample Result Summary

Analytes (Dissolved)	Freshwater Acute Criteria (ug/L)[1]				Human Health (ug/L)	Sample Result (ug/L)
	Conservative[2]	Average[3]	Median[4]	Maximum[5]		
Nickel	56.44	54.49	101.45	182.36	4600	**0.713**
Zinc	36.20	34.95	65.13	117.18	26000	**9.07**

[1] WQC for cadmium, chromium III, copper, lead, nickel, silver, and zinc are a function of total hardness as calcium carbonate (CaCO3) mg/L and the Water Effect Ratio (WER).
[2] WQC calculated based on a conservative or minimum hardness value of 25 mg/L as defined in 9 VAC 25-260-140.
[3] WQC calculated based on the average hardness from historical sampling in 2017 and 2018 at RO-020.
[4] WQC calculated based on the hardness value of 50 mg/L used by VADEQ in 2015 when running a Wasteload Allocation Analysis in April 2015 based on OWP Guidance Memorandum 00-2011.
[5] WQC calculated based on a maximum hardness value of 100 mg/L as defined in 9 VAC 25-260-140.
Bold sample result indicates exceedance of one or more Water Quality Criteria.
Bold WQC that was exceeded based on results

Legend

- RO 021
- SWMU Point - Status: Closed
- Drainage Area RO 021
- Waterway

N

Representative Outfalls 021

0 0.01 0.02 0.04 Miles

SES Construction and Fuel Services LLC

5.20 RO-021 – NVESD SOUTH

The drainage area for Representative Outfall 021 (RO-021) is located in the southeastern region of Fort Belvoir. The outfall is the outlet of a concrete pipe that crosses Totten Road at the bottom of a steep hill just southeast of Building 357. The drainage area for RO-021 encompasses an undeveloped forested area along a hill off of Totten Road, paved parking areas, research and development lab, and a substation and a loading and unloading area. Buildings 305, 309, and 357 are all within the drainage area for RO-021.

Most of the stormwater run-off received at RO-021 is conveyed via sheet flow down the steep hill prior to converging at the culvert inlet at the bottom of the hill. Generally stormwater moves across the drainage area from the west to the east down steep hills before converging and then crossing Totten Road and discharging at the outfall. The outfall discharges to an unnamed stream which flows southeast and empties into Ponton Basin then to Gunston Cove. A stream restoration project is currently in the design phase for the unnamed stream.

5.20.1 RO-021 – SWMU Evaluation

As shown on the drainage map for RO-021, three SWMUs – B-17, B-19, and I-03 - are located within and near the drainage area of RO-021. All three SWMUs are Administratively Closed UU/UE based on reviews of historical records, which indicated that there were no documented releases or spills of hazardous materials to the environment in relation to them. No sampling was conducted as part of the investigations of these SWMUs. These three SWMUs are discussed below.

1. ***SWMU ID:*** B-17

   SWMU Name: Lab Storage Area

   Indoor/Outdoor: Indoor

   Type, Function, and History: SWMU B-17 was identified as a set of four chemical laboratory storage hoods located in four separate rooms within Building 305. Historical records for SWMU B-17 indicated that there were no documented releases or spills to the environment related to the storage of the hazardous materials in Building 305. Additionally, the storage site no longer exists as the four storage hoods were removed after the building was renovated in the early 1990s. As such, SWMU B-17 received regulatory concurrence from US EPA Region 3 for Administrative Closure.

   Status: Administrative Closure (AC)

   Level of Closure: UU/UE

   Regulatory Approval: 07/06/2012

   Statement of Basis: 10/20/2014

   Residual COCs (if applicable): N/A

2. ***SWMU ID:*** B-19

   SWMU Name: Lab Storage Area

   Indoor/Outdoor: Indoor

   Type, Function, and History: SWMU B-19 was identified as a set of six laboratory chemical storage hoods located in rooms 126, 166, 237, 255, 266 and 301 in Building 357. Historical records from SWMU B-19 indicated that there were no documented releases or spills to the environment related to the storage of the hazardous materials inside the laboratory hoods. As such, SWMU B-19 received regulatory concurrence from US EPA Region 3 for Administrative Closure. Three laboratory hoods are still active within Building 357 and have no reported spills or releases.

Status: Administrative Closure (AC)
Level of Closure: UU/UE
Regulatory Approval: 07/06/2012
Statement of Basis: 10/20/2014
Residual COCs (if applicable): N/A

3. ***SWMU ID:*** I-03
SWMU Name: Inactive Acid Neutralization Pit
Indoor/Outdoor: Outdoor
Type, Function, and History: SWMU I-03 was identified as a pit filled with marble and limestone chips used to neutralize battery wastewater generated by laboratory sinks which then drained into the installation's sanitary sewer system at Building 305. Historical records from SWMU I-03 indicate that there are no documented releases or spills of hazardous materials to the environment related to this unit. Additionally, the acid wastewater was neutralized by the limestone chips and then directly drained into the installation's sanitary sewer. The unit has been removed and no indication of release or contamination was noted. As such, SWMU I-03 received regulatory concurrence for Administrative Closure.
Status: Administrative Closure (AC)
Level of Closure: UU/UE
Regulatory Approval: 07/06/2012
Statement of Basis: 10/20/2014
Residual COCs (if applicable): N/A

Required Sampling: Based on the interior location of two SWMUs, record searches, AC UU/UE closures, and absence of active SWMUs, this evaluation indicated that Fort Belvoir is not required to characterize the stormwater runoff at Outfall RO-021 for the substances noted in Attachment A of the permit.

Legend

- RO 022
- SWMU Point - Status: Closed
- Drainage Area RO 022
- Waterway
- Fort Belvoir Border

N

Representative Outfalls 022

0 0.01 0.02 0.04 Miles

SCF SES Construction and Fuel Services LLC

5.21 RO-022 – 300 AREA MARINA

The drainage area for Representative Outfall 022 (RO-022) is located in the southern most region of Fort Belvoir. The outfall is the outlet of a concrete pipe that crosses the unnamed service road to the 300 area marina, just inside the access gate. The drainage area for RO-022 encompasses paved parking areas, a general purpose lab, equipment and vehicle service areas and multiple material storage locations. Buildings 338, 341, and 392 are all within the drainage area for RO-022.

Most of the stormwater run-off received at RO-022 is conveyed via sheet flow into bio-retention ponds before discharging at the outfall. Generally stormwater moves across the drainage area from the northeast to the southwest before crossing the unnamed service road and discharging at the outfall. The outfall discharges to an unnamed stream which flows southwest and empties into Gunston Cove.

5.21.1 RO-022 – SWMU Evaluation

As shown on the drainage map for RO-022, one SWMU – E-08 - is located around the drainage area of RO-022. This SWMU is AC UU/UE based on a review of historical records, which indicated that there were no documented releases or spills of hazardous materials to the environment in relation to it. No sampling was conducted as part of the investigation of this SWMU. This SWMU is discussed below.

1. ***SWMU ID:*** E-08

   SWMU Name: Coast Guard Waste POL Storage Area

   Indoor/Outdoor: Outdoor

   Type, Function, and History: SWMU E-08 was identified as a waste POL storage area for Coast Guard boats and consists of an eight foot by fifteen foot concrete pad with two foot high walls as a berm. Historical records from SWMU E-08 indicated that there were no documented releases or spills of hazardous materials to the environment related to this unit. SWMU E-08 is not considered a SWMU since historical records indicate that no documented releases have occurred at this site. As such, SWMU E-08 received regulatory concurrence from US EPA Region 3 for Administrative Closure.

   Status: Administrative Closure (AC)

   Level of Closure: UU/UE

   Regulatory Approval: 07/06/2012

   Statement of Basis: 10/20/2014

   Residual COCs (if applicable): N/A

Required Sampling: Based on the record search, AC UU/UE closure, and absence of active SWMUs, this evaluation indicated that Fort Belvoir is not required to characterize the stormwater runoff at Outfall RO-022 for the substances noted in Attachment A of the permit.

Legend

- RO 023
- SWMU Point - Status: Closed
- Drainage Area RO 023
- Waterway

N

Representative Outfalls 023

0 0.0050.01 0.02 Miles

SES Construction and Fuel Services LLC

5.22 RO-023 – 1400 AREA WAREHOUSES

Outfall 023 is located northwest of Building 1497 in a steeply graded wooded area, causing stormwater from the drainage area to flow in a westerly direction. Five (5) buildings and one materials storage lot occupy the drainage area and are used for various purposes by different organizations.

Each warehouse is about 50 feet by 100 feet and are serviced by a paved access road. Several storm drains are present on either side of the roadway, and most of the drainage flows to the west into a series of channels that feed into an unnamed tributary (perennial stream) to Accotink Creek.

Building 1490 is a permitted 1 year hazardous waste storage facility under the installation's RCRA Part B Permit. The facility has not stored waste since 2011 and therefore is undergoing closure activities. Building 1496 is used as a pest management warehouse for the installation. All activities occur inside these facilities and therefore there is no exposure to the outdoor environment.

Runoff from Building 1484, an administrative warehouse, and the outdoor laydown area flow to north either as sheet flow or through pipes before discharging to another unnamed tributary (ephemeral stream) to the Accotink Creek.

5.22.1 RO-023 – SWMU Evaluation

As shown on the drainage map for RO-023, three SWMUs – B-09, B-16, and N-13 - are located within the drainage area of RO-023. All three SWMUs are Administratively Closed UU/UE. Record searches were conducted for all three SWMUs, and soil sampling was conducted at SWMU B-09. These three SWMUs are discussed below.

1. ***SWMU ID:*** B-09
   SWMU Name: Building T-1430 PCB Storage Area
   Indoor/Outdoor: Indoor
   Type, Function, and History: SWMU B-09 was a former transformer storage area located at Building 1430 that became operational in 1982. In 1997, soil samples around and underneath Building 1430 were collected and analyzed for PCBs. Site investigations did not indicate the presence of contamination at the site. Building 1430 has been demolished, and the area is now paved and used as a storage area for trailers and large generators. According to information provided in the 2018 Update to the Fort Belvoir PCB TMDL Action Plan, investigation of this SWMU determined that secondary containment was present at the site when transformers were stored there. The SWMU received Administrative Closure from US EPA Region 3 in July 2012. No Further Action was recommended in the 2018 Fort Belvoir PCB TMDL Action Plan.
   Status: Administrative Closure (AC)
   Level of Closure: UU/UE
   Regulatory Approval: 07/06/2012
   Statement of Basis: 10/20/2014
   Residual COCs (if applicable): None

2. ***SWMU ID:*** B-16
   SWMU Name: Building 1490 Pesticide Mixing Room Drum Storage
   Indoor/Outdoor: Indoor

Type, Function, and History: SWMU B-16 was identified as an eight foot by eight foot concrete bermed area located in the southwest corner of Building 1490 that was used as a pesticide storage area. Historical records indicated there was no evidence or indication that a release of hazardous materials/constituents occurred from this unit. As such, SWMU B-16 received regulatory concurrence from US EPA Region 3 for Administrative Closure.

Status: Administrative Closure (AC)

Level of Closure: UU/UE

Regulatory Approval: 07/06/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable): N/A

3. ***SWMU ID:*** N-13

   SWMU Name: Building 1490 Hazardous Material Storage Area

   Indoor/Outdoor: Indoor

   Type, Function, and History: SWMU N-13, located inside Building 1490, was identified as a hazardous material storage facility. Building 1490 and the storage of hazardous materials within the structure are managed through Fort Belvoir's Permit for Hazardous Waste Storage. Review of available historical records indicates that no release or spill has occurred at this site. Additionally, the building has secondary containment structures in place and has no pathway for chemicals to be released into the environment. As such, SWMU N-13 received regulatory concurrence from US EPA Region 3 for Administrative Closure.

   Status: Administrative Closure (AC)

   Level of Closure: UU/UE

   Regulatory Approval: 07/06/2012

   Statement of Basis: 10/20/2014

   Residual COCs (if applicable): N/A

Required Sampling: Based on the soil sampling results, record searches, UU/UE closures, and absence of active SWMUs, this evaluation indicated that Fort Belvoir is not required to characterize the stormwater runoff at Outfall RO-023 for the substances noted in Attachment A of the permit.

Legend

- RO 024
- SWMU Point - Status: Closed
- Drainage Area RO 024
- Waterway

N

Representative Outfalls 024

0 0.0125 0.025 0.05 Miles

SES Construction and Fuel Services LLC

5.23 RO-024 – ADFE SW

The drainage area for Outfall 024 is located on the southwest portion of the ADF area of Fort Belvoir. The outfall is located in a catchment basin across the road and just south of Building 2826. The drainage area contains buildings 2800, 2802, 2804, 2805, 2806, 2807, 2809, 2822, 2824, 2825, 2826, 2827, 2829, and 2862.

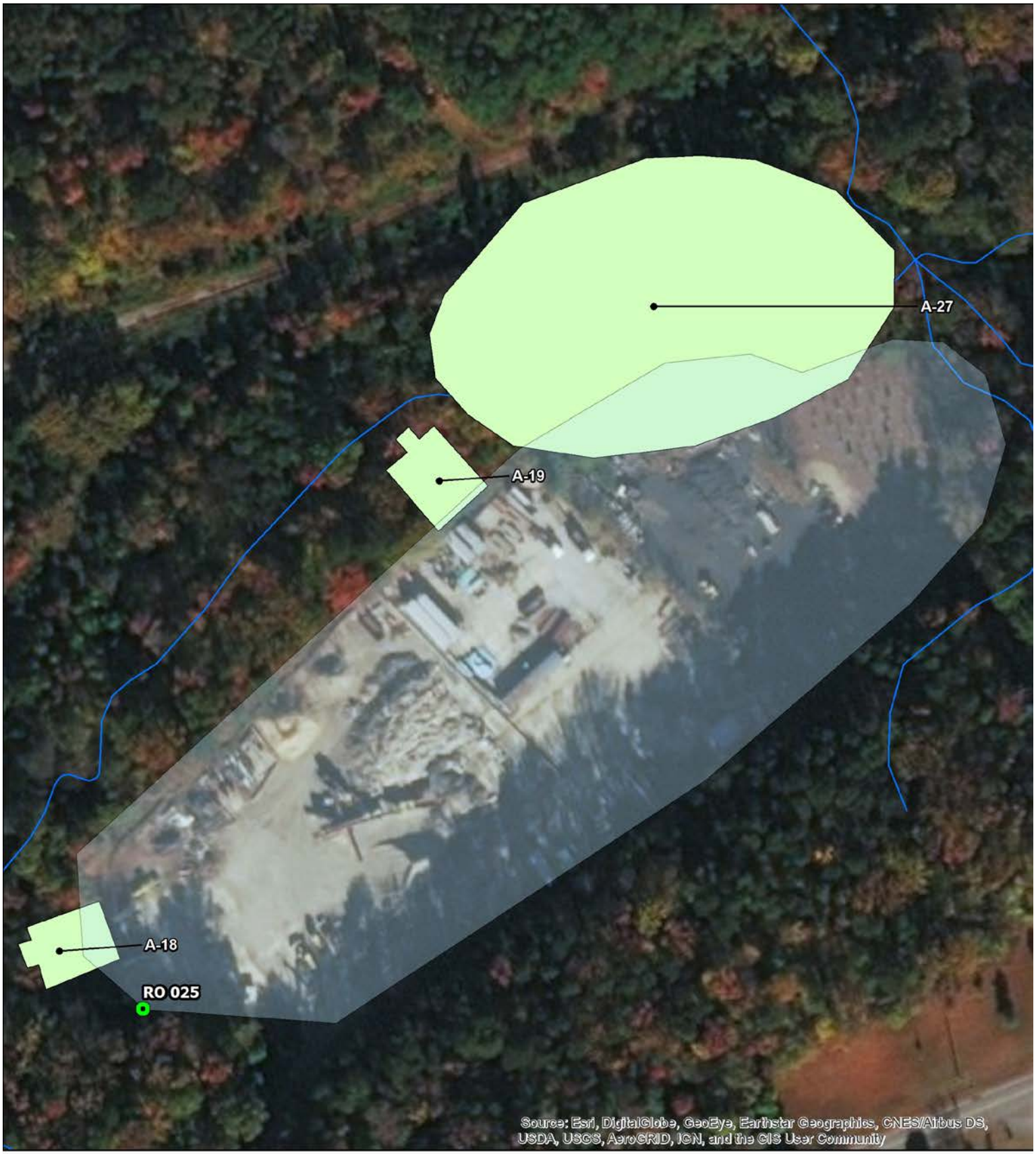
The Outfall receives runoff from multiple facilities, outdoor activities, material and waste storage, as well as offices and parking areas. Most of the stormwater runoff at Outfall 024 is conveyed through storm drains to the catchment basin from the southwest, northwest and northeast. From the catchment basin, the water flows south towards an unnamed stream before heading east/northeast towards a river that drains into Dogue Creek.

5.23.1 RO-024 – SWMU Evaluation

As shown on the drainage map for RO-024, one SWMU – J-05 – is located within the drainage area of RO-024. This SWMU is Administratively Closed UU/UE based on a review of historical records, which indicated that there were no documented releases or spills of hazardous materials to the environment. No sampling was conducted as part of the investigation. This SWMU is discussed below.

1. ***SWMU ID:*** J-05
   SWMU Name: DCEETA Incinerator
   Indoor/Outdoor: Indoor
   Type, Function, and History: SWMU J-05 was identified as a No. 2 Oil-fueled incinerator used to destroy classified documents inside Building 2804. The incinerator was deactivated in 1991. A review of historical records indicated that there were no releases of hazardous material or impacts to the environment from operation of this unit. As such, SWMU J-05 received regulatory concurrence from US EPA Region 3 for Administrative Closure.
   Status: Administrative Closure (AC)
   Level of Closure: UU/UE
   Regulatory Approval: 07/06/2012
   Statement of Basis: 10/20/2014
   Residual COCs (if applicable): N/A

Required Sampling: Based on the interior location of this SWMU, record search, UU/UE closure, and absence of active SWMUs, this evaluation indicated that Fort Belvoir is not required to characterize the stormwater runoff at Outfall RO-024 for the substances noted in Attachment A of the permit.



Legend

- RO 025
- Drainage Area RO 025
- SWMU Area - Status: Closed
- Waterway

N

Representative Outfalls 025

0 0.01 0.02 0.04 Miles

SCF SES Construction and Fuel Services LLC

5.24 RO-025 – MEADE ROAD CONTRACTOR LOT

The drainage area for Representative Outfall 025 (RO-025) is located in the central region of Fort Belvoir. The RO-025 is located in the southern most corner of the Meade Road Contractor Lot approximately 15 meters from the cement barriers/wall that border much of the lot. There are no permanent buildings located within this drainage area.

The outfall receives sheet flow run-off from an open-air construction staging and storage area, bounded by down sloped wooded areas. Most of the storm water run-off at Outfall 025 is sheet runoff that flows across the laydown lot and moves from the northeast to the southwest toward outfall 025. From Outfall 025 water flows southwest into Mason Run before heading southeast and discharging into Accotink Creek.

The Contractor Lot is approximately five (5) acres in size and is split up into 14 cells ranging from 0.05 to 1.09 acres. The remaining portion of the lot is dedicated to vehicle access. The majority of industrial activities occur within these cells and are dependent on project requirements. This may range from staging of equipment, vehicles, and materials to stockpiling of gravel, soil, asphalt, concrete, and construction debris.

5.24.1 RO-025 – SWMU Evaluation

As shown on the drainage map for RO-025, three SWMUs – A-18, A-19, and A-27 - are located within the drainage area of RO-025. SWMU A-27 is NFA with LUCs. SWMUs A-18 and A-19 – both NFA UU/UE - are located near the inactive coal storage facility, which consisted of a large concrete pad used to store coal for Fort Belvoir's power plants. Coal is no longer stored at the facility. All three SWMUs are discussed below.

1. ***SWMU ID:*** A-18

   SWMU Name: Coal Storage Wastewater Treatment Unit 1

   Indoor/Outdoor: Outdoor

   Type, Function, and History: SWMU A-18 was identified as a concrete structure designed to control coal dust carried offsite by water runoff. The water runoff was first collected in a primary sloped concrete settling basin measuring 10 ft by 50 ft by 6 ft deep before flowing into a secondary basin measuring 25 ft by 50 ft by 3 ft. The final collection point was a shallow concrete basin measuring 25 ft by 50 ft by 1 ft deep which was filled with crushed limestone to aid in neutralizing the acidity of the water. Runoff water passed through these three stages to decrease the amount of suspended solids and neutralize the water's high acidity level attributed from contact with the coal piles stored on site. The water runoff was then discharged from two outflow pipes into a concrete culvert that emptied into Mason Run; a small perennial stream, that flows on the western side of the coal storage facility. The site became operational sometime between 1982 and 1983. The discharge from the facility was regulated under a National Pollutant Discharge Elimination System (NPDES) Permit, No. VA0002411.

   A Phase I RFI investigation was performed at SWMU A-18 in October 2008. Investigation activities at SWMU A-18 coincided with the field investigations carried out at SWMU A-19 due to the proximity of the co-located sites. Field activities included the advancement of three soil borings to a depth of 1 foot below the concrete structure. In addition, sediment and surface water samples were collected from piping associated with the water treatment facility and from Mason Run which runs along the northern and western boundaries of SWMU A-18. Samples collected were measured for pH values and submitted to the laboratory for analysis of TAL metals.

Arsenic was detected in soil samples above the industrial Risk-Based Concentration (RBC) levels. However, the detected arsenic concentrations were within the historical background values at Fort Belvoir. Arsenic was also detected in the sediment samples above industrial RBC levels. The detected arsenic concentrations found in sediment were above historical background values at Fort Belvoir thus, former activities at SWMU A-18 may have impacted the sediments in the area. However, arsenic was not detected in the surface water samples. Cobalt was detected in sediment samples above the corresponding residential RBC value. However, the detected concentration of cobalt did not exceed the corresponding industrial RBC value in sediment. None of the detected concentrations of metals exceeded their corresponding MCLs or Tap water RBCs in surface water.

Fort Belvoir performed an additional assessment on the impact to the surrounding stream. Based on this assessment, Fort Belvoir determined that the contamination had no impact on the stream and the contamination was limited to within the structure. Based on the sample results and subsequent risk and ecological assessment, Fort Belvoir recommended no further action for SWMU A-18. As residual arsenic and cobalt may be present in soil and sediment, a notation will be added to Fort Belvoir's Master Plan for future management of the site by the Installation.

The site is currently being considered for use a sediment basin to support current site activities. There is currently a project scope awaiting design and funding that would bring the facility back online with a liner to prevent contact with any residual contamination that may be present within the unit.

Status: No Further Action

Level of Closure: UU/UE

Regulatory Approval: 12/7/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable):

Soil: arsenic (8.7 mg/kg)

Sediment: arsenic (18.3 mg/kg), cobalt (25.1 mg/kg)

LUCs (if applicable): N/A

2. ***SWMU ID:*** A-19

SWMU Name: Coal Storage Wastewater Treatment Unit 2

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU A-19 was described as a concrete structure designed to control coal dust carried offsite by water runoff. The water runoff was first collected in a primary settling basin measuring 11 ft by 49 ft by 6 ft deep before flowing into a secondary basin measuring 25 ft by 49 ft by 3 ft deep. The final collection point was a concrete basin measuring 25 ft by 49 ft by 1 ft deep which was filled with crushed limestone to aid in neutralizing the acidity of the water. Runoff water passed through these three stages to decrease the amount of suspended solids and neutralize the water's high acidity level attributed from contact with the coal piles stored on site. The water runoff was then discharged from two outflow pipes into a concrete culvert that emptied into Mason Run; a small perennial stream, that flows on the western side of the coal storage facility. The site became operational sometime between 1982 and 1983. The discharge from the facility was regulated under a National Pollutant Discharge Elimination System (NPDES) Permit, No. VA0002411.

A Phase I RFI investigation was performed at SWMU A-19 in October 2008. Investigation activities at SWMU A-19 coincided with the field investigations carried out at SWMU A-18 due to the proximity of the co-located sites. Field activities included the advancement of three soil

borings to a depth of 1 foot below the concrete structure. In addition, sediment and surface water samples were collected from piping associated with the water treatment facility and from Mason Run which runs along the northern and western boundaries of SWMU A-19. Samples collected were measured for pH values and submitted to the laboratory for analysis of TAL metals.

Arsenic and cobalt were detected in the soil samples above RBC standards for residential and industrial soils. However, the detected arsenic concentrations were within the historical background values at Fort Belvoir. Cobalt was detected at a concentration that exceeded its corresponding residential RBC but was lower than its corresponding industrial RBC value in soil. Arsenic was also detected in the sediment samples above industrial RBC levels. Additionally, sediment collected inside the settling basin exceeded the historical background values for arsenic at Fort Belvoir. However, arsenic detections in sediment collected from the outfall of the unit and from the stream to which the unit reportedly drained were within historical background values at Fort Belvoir for arsenic. Thus, sediment contamination was limited to the structure.

Thallium was detected in surface water samples collected from the primary settling basin above MCL and Tap water RBC values. This suggests the former activities at SWMU A-19 may have impacted the surface water within the unit of SWMU A-19. Thallium was not detected in surface water collected from the stream to which the structure reportedly drained. Thus, surface water contamination was limited to that within the structure. Fort Belvoir performed an additional assessment on the impact to the surrounding stream. Based on this assessment, Fort Belvoir determined that the contamination had no impact on the stream and the contamination was limited to within the structure. Based on the sample results and subsequent risk and ecological assessment, Fort Belvoir recommended no further action for SWMU A-19. As residual arsenic, cobalt, and thallium may be present in soil and sediment, a notation will be added to Fort Belvoir's Master Plan for future management of the site by the Installation.

The site is currently being considered for use a sediment basin to support current site activities. There is currently a project scope awaiting design and funding that would bring the facility back online with a liner to prevent contact with any residual contamination that may be present within the unit.

Status: No Further Action

Level of Closure: UU/UE

Regulatory Approval: 12/7/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable):

Soil: arsenic (5.9 mg/kg), cobalt (33.5 mg/kg)

Sediment: arsenic (14.1 mg/kg)

Surface Water: thallium (2.9 ug/L)

LUCs (if applicable): N/A

3. ***SWMU ID:*** A-27

SWMU Name: Suspected Sanitary Landfill C

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU A-27 was identified on site maps from the 1930s and 1940s as an inactive site used for disposing of sanitary waste since as early as the 1900s and is located south of Willis Rd. In October 2008, a Phase I RFI was performed at SWMU A-27. Field activities included the collection of five subsurface soil samples, four groundwater samples, three sediment samples, and two surface water samples. These samples were collected and sent to the laboratory for the analysis of metals, volatiles, semi volatiles, and pesticides.

Volatile organic compounds and pesticide compounds were not detected in concentrations exceeding their corresponding residential/industrial RBC values and MCL values in any of the collected media (soil, groundwater, sediment, or surface water). The lack of significant levels of detected analytes suggests that the activities have not affected the soil, groundwater, sediment, and surface water in the vicinity of SWMU A-27. Based on the conclusions of this investigation, No Further Action with Land Use Controls (LUCs) was approved by EPA Region 3 for this site for current and anticipated land use. However, as waste material (trash) is still in place, a LUC is required in order to ensure Fort Belvoir's continued compliance with the industrial land use scenarios.

Status: No Further Action (NFA)

Level of Closure: Industrial

Regulatory Approval: 12/7/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable):

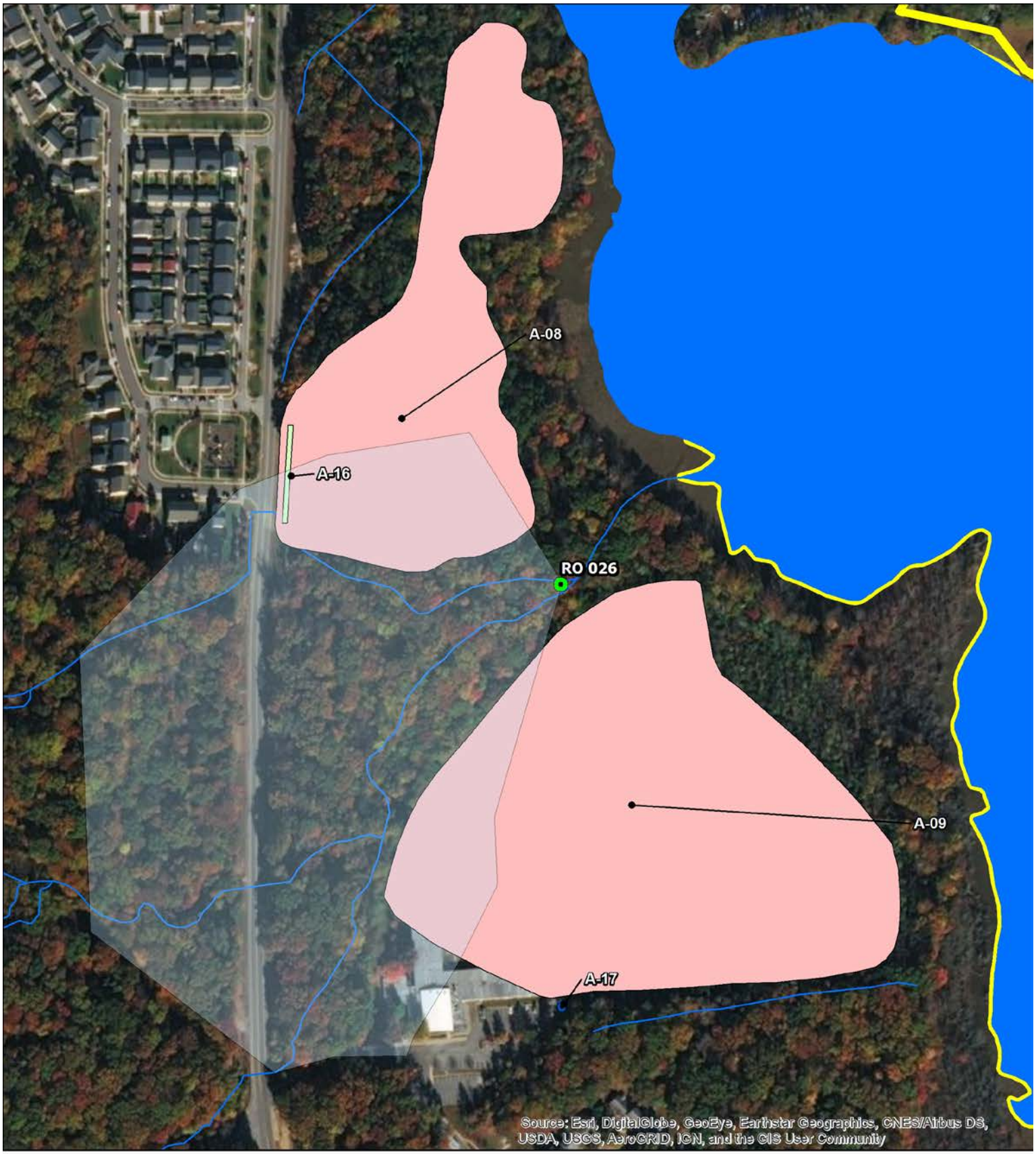
Soil: arsenic (4.4 mg/kg)

Sediment: arsenic (4.5 mg/kg)

Groundwater: arsenic (3.1 ug/L), bis(2-ethylhexyl) phthalate (11 ug/L)

LUCs (if applicable): AHA Required, Limit development of the site

Required Sampling: Based on the sampling results, NFA closures, and absence of active SWMUs, this evaluation indicated that Fort Belvoir is not required to characterize the stormwater runoff at Outfall RO-025 for the substances noted in Attachment A of the permit.



Legend

- RO 026
- Drainage Area RO 026
- Waterway
- Fort Belvoir Border
- SWMU Point - Status: Closed
- SWMU Area - Status: Closed
- SWMU Area - Status: Active

N

Representative Outfalls 026

0 0.0275 0.055 0.11 Miles

SES Construction and Fuel Services LLC

5.25 RO-026 – GEORGE WASHINGTON VILLAGE AND MARKHAM SCHOOL LANDFILLS

The drainage area for ISW Outfall 026 encompasses parts of two inactive/closed landfills, A08 (George Washington Village Landfill) and A09 (Markham School Landfill), as well as a portion of Markham school and its playground.

To the north of RO-026 is the George Washington Village Landfill which encompasses mostly heavily wooded areas. Water flows to the south/southeast to an unnamed tributary which continues east to Dogue Creek. Dogue Creek, which is tidal, directly abuts the northeast corner of the landfill and is separated from the remainder of the landfill by forested wetlands. A residential area, George Washington Village, lies to the west of the landfill, across Mount Vernon Road. An undeveloped forested area lies to the north of the landfill. A08 is approximately 8.5 acres and the perimeter is not fenced.

To the south of RO-026 is the Markham School landfill. Water flows west and north/northeast to an unnamed tributary as sheet flow over a large grassy open field. Presently, Markham School, built in 1962, a playground, an open mowed field and a forest are located on part of the landfill. A09 is separated from A08 by an unnamed tributary of Dogue Creek. The unnamed tributary flows through RO-026 before continuing east towards Dogue Creek. A09 is approximately 15 acres and the perimeter is not fenced.

The outfall is located at a confluence of the two unnamed streams between landfills A08 and A09 and receives most of its runoff via sheet flow from either an open grassy area to the south (A09) or the heavily wooded area to the north (A08).

5.25.1 RO-026 – SWMU Evaluation

As shown on the drainage map for RO-026, four SWMUs are located within the drainage area of RO-026. Two SWMUs – A-08 and A-09 - are landfills and active SWMUs undergoing corrective measures. The other two SWMUs – A-16 and A-17 which are landfill interceptor trenches and are AC UU/UE. These SWMUs are discussed below.

1. ***SWMU ID:*** A-08

   SWMU Name: George Washington Village Landfill

   Indoor/Outdoor: Outdoor

   Type, Function, and History: SWMU A-08 is a closed, inactive landfill that operated from the 1930s to 1956 accepting sanitary waste and construction debris. VOCs and SVOCs in groundwater and VOCs in nearby surface water were detected during a 2008 Phase I RFI. A Phase II RFI, conducted in 2010, identified numerous constituents above screening levels in groundwater and surface water, with main concerns being elevated PCE and TCE in groundwater. For this reason, a Corrective Measure Study (CMS) was recommended.

   The Final CMS Report, completed in August 2013, documented the preferred corrective measure for addressing landfill waste as engineered vegetative cover enhancement, long term monitoring, and LUCs; no corrective measure was selected to address groundwater in the CMS Report. However, because of insufficient data to assess whether MNA, long term monitoring, and LUCs can achieve MCLs at Dogue Creek within 30 years, Fort Belvoir proposed two years of MNA data be collected prior to selecting a corrective measure for groundwater. EPA Region 3 approved the Final CMS Report recommendation in a letter dated May 19, 2014.

   In 2016, following the collection of the additional MNA data, Fort Belvoir determined that MNA was feasible for site A-08. Fort Belvoir submitted an Internal Decision Document (DD) Addendum selecting MNA, LTM, and LUCs to address groundwater contamination at site A-08. EPA Region 3 approved the 2016 Internal DD Addendum recommendation in an email dated

January 5, 2016. Enhancements to the landfill cover to address the landfill waste were completed in late 2016. Long-term groundwater monitoring was initiated in 2016 and the work plan was approved by VADEQ in 2017.

Status: Corrective Measure Implementation (CMI)

Level of Closure: **Active**

Regulatory Approval: 05/19/2014 (soil), 01/05/2016 (groundwater)

Statement of Basis: 10/31/2014 (soil), 09/13/2017 (groundwater)

Residual COCs (if applicable):

Surface soil: benzo[a]pyrene (200 ug/kg), benzo[b]fluoranthene (220 ug/kg), dibenz[a,h]anthracene (27 ug/kg), aluminium (10,700 mg/kg), arsenic (3.9 mg/kg), iron (16,500 mg/kg), manganese (235 mg/kg), vanadium (26.8 mg/kg)

Subsurface soil: benzo[a]pyrene (25 ug/kg), arsenic (2.5 mg/kg), iron (10,900 mg/kg), manganese (258 mg/kg), vanadium (18.9 mg/kg)

Sediment: arsenic (4.6 mg/kg)

Groundwater: tetrachloroethene (198 ug/L), trichloroethene (29.6 ug/L)

LUCs (if applicable): Excavation and drilling restrictions and notifications, signage, notations in Fort Belvoir Master Plan, landfill cap inspections, methane monitoring, record keeping procedures.

2. ***SWMU ID:*** A-09

SWMU Name: Markham School Landfill

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU A-09 is a closed, inactive landfill that operated from the 1930s to 1956 accepting sanitary waste. VOCs and metals in groundwater and surface water were detected during the Phase I RFI; therefore, Fort Belvoir performed additional investigations to determine the full extent of the contamination at this site. Phase II RFI data, collected in 2010, and indicated that monitoring of VOCs, SVOCs and metals in groundwater, landfill gas (LFG) monitoring and capping over a portion of the landfill was needed. For this reason, a Corrective Measure Study (CMS) was recommended.

The Final CMS Report, completed in August 2013, documented the preferred corrective measure for addressing landfill waste at CC-A09 as engineered vegetative cover enhancement, long term monitoring, and land use controls (LUCs); no corrective measure was selected to address groundwater in the CMS Report. However, because of insufficient data to assess whether MNA, long term monitoring, and LUCs can achieve MCLs at Dogue Creek within 30 years, Fort Belvoir proposed two years of MNA data be collected prior to selecting a corrective measure for groundwater. EPA Region 3 approved the Final CMS Report recommendation in a letter dated May 19, 2014.

In 2016, following the collection of the additional MNA data, Fort Belvoir determined that MNA was feasible for site A-09. Fort Belvoir submitted an Internal Decision Document (DD) Addendum selecting MNA, LTM, and LUCs to address groundwater contamination at site A-09. EPA Region 3 approved the 2016 Internal DD Addendum recommendation in an email dated January 5, 2016. Enhancements to the landfill cover to address the landfill waste were completed in late 2016. Long-term groundwater monitoring was initiated in 2016.

In addition, Fort Belvoir operates a methane detection/alarm system in order to monitor levels of methane and other landfill gases at the Markham School and to ensure protection of human health at the facility. The building's sub-slab has also been retrofitted to allow for passive ventilation. To ensure protection, Fort Belvoir has implemented a monitoring program to regularly calibrate

the methane alarm system; inspect and monitor the existing gas monitoring probes and foundation vents around the school for methane levels and static pressure; and, monitor for methane levels inside the school.

Status: Corrective Measure Implementation (CMI)

Level of Closure: **Active**

Regulatory Approval: 05/19/2014 (soil), 01/05/2016 (groundwater)

Statement of Basis: 10/31/2014 (soil), 09/13/2017 (groundwater)

Residual COCs (if applicable):

Surface Soil: benzo[a]pyrene (170 ug/kg), benzo[b]fluoranthene (240 ug/kg), dibenz[a,h]anthracene (28 ug/kg), 4,4-DDT (2,800 ug/kg), aluminium (13,000 mg/kg), arsenic (6.9 mg/kg), chromium (31.7 mg/kg), iron (26900 mg/kg), manganese (176 mg/kg), mercury (1.9 mg/kg), vanadium (28.1 mg/kg)

Subsurface soils: aluminum (12,800 mg/kg), arsenic (2.1 mg/kg), iron (13,500 mg/kg), vanadium (26.1 mg/kg)

Groundwater: tetrachloroethene (134 ug/L)

LUCs (if applicable): Excavation and drilling restrictions and notifications, signage, notations in Fort Belvoir Master Plan, landfill cap inspections, methane monitoring, record keeping procedures. Quarterly methane monitoring of the inside of the school, foundation vents under school, and gas probes surrounding school.

3. ***SWMU ID:*** A-16

SWMU Name: George Washington Village Landfill Interceptor Trench

Indoor/Outdoor: Outdoor

Type, Function, and History SWMU A-16 is a Landfill Interceptor Trench which was installed to manage landfill gas being generated by George Washington Landfill (SWMU A-08). SWMU A-16 was investigated as part of the Phase I Investigation for SWMU A-08 in 2008 which identified no impact to the environment was attributed to the interceptor trench. Further in January 2011, US EPA concurred that it does not meet the definition of a SWMU and therefore granted Administrative Closure. Results considered here are for the closest sampling locations for groundwater and soil from the RFI for A-08/A-16.

Status: Administrative Closure

Level of Closure: UU/UE

Regulatory Approval: 01/12/2011

Statement of Basis: 10/20/2014

Residual COCs (if applicable):

Soil: arsenic (2.9 mg/kg)

Groundwater: iron (34,800 ug/L), manganese (1,930 ug/L), tetrachloroethylene (31 ug/L)

LUCs (if applicable): N/A

4. ***SWMU ID:*** A-17

SWMU Name: Markham School Landfill Gas Interceptor Trench

Indoor/Outdoor: Outdoor

Type, Function, and History SWMU A-17 is a Landfill Interceptor Trench which was installed to manage landfill gas being generated by Markham School Landfill (SWMU A-09). SWMU A-17 was investigated as part of the Phase I Investigation for SWMU A-09 in 2008 which identified no impact to the environment as attributed to this unit. Further in January 2011, US EPA concurred that it does not meet the definition of a SWMU and therefore granted Administrative Closure. Results considered here are for the closest sampling locations for sediment, groundwater, and soil from the RFI for A-09/A-17

Status: Administrative Closure

Level of Closure: UU/UE

Regulatory Approval: 1/12/2011

Statement of Basis: 10/20/2014

Residual COCs (if applicable):

Soil: arsenic (2.4 mg/kg)

Sediment: 4,4, DDE (180 ug/kg), 4,4, DDT (22 ug/kg), lead (50.7 mg/kg)

Groundwater: iron (18,800 ug/L), manganese (911 ug/L)

LUCs (if applicable): N/A

Required Sampling: Based on the presence of two active SWMUs within this drainage outfall, this evaluation determined that it is necessary for Fort Belvoir to monitor and characterize the discharge from RO-026.

5.25.2 RO-026 – SWMU Sample Analysis

A sample was collected at RO-026 on January 24, 2019 for most of the substances noted in Attachment A, "Water Quality Criteria Monitoring". The outfall was sampled for dissolved metals on May 23, 2019 in order to capture samples of dissolved metals as filter screens used during initial sampling failed rendering the samples inadequate. The sample results for constituents detected above the specified Quantification Level (QL) are summarized in Table 10 below. All exceedances of Water Quality Criteria is highlighted in red. The completed Attachment A and laboratory results are provided in Appendix G-7.

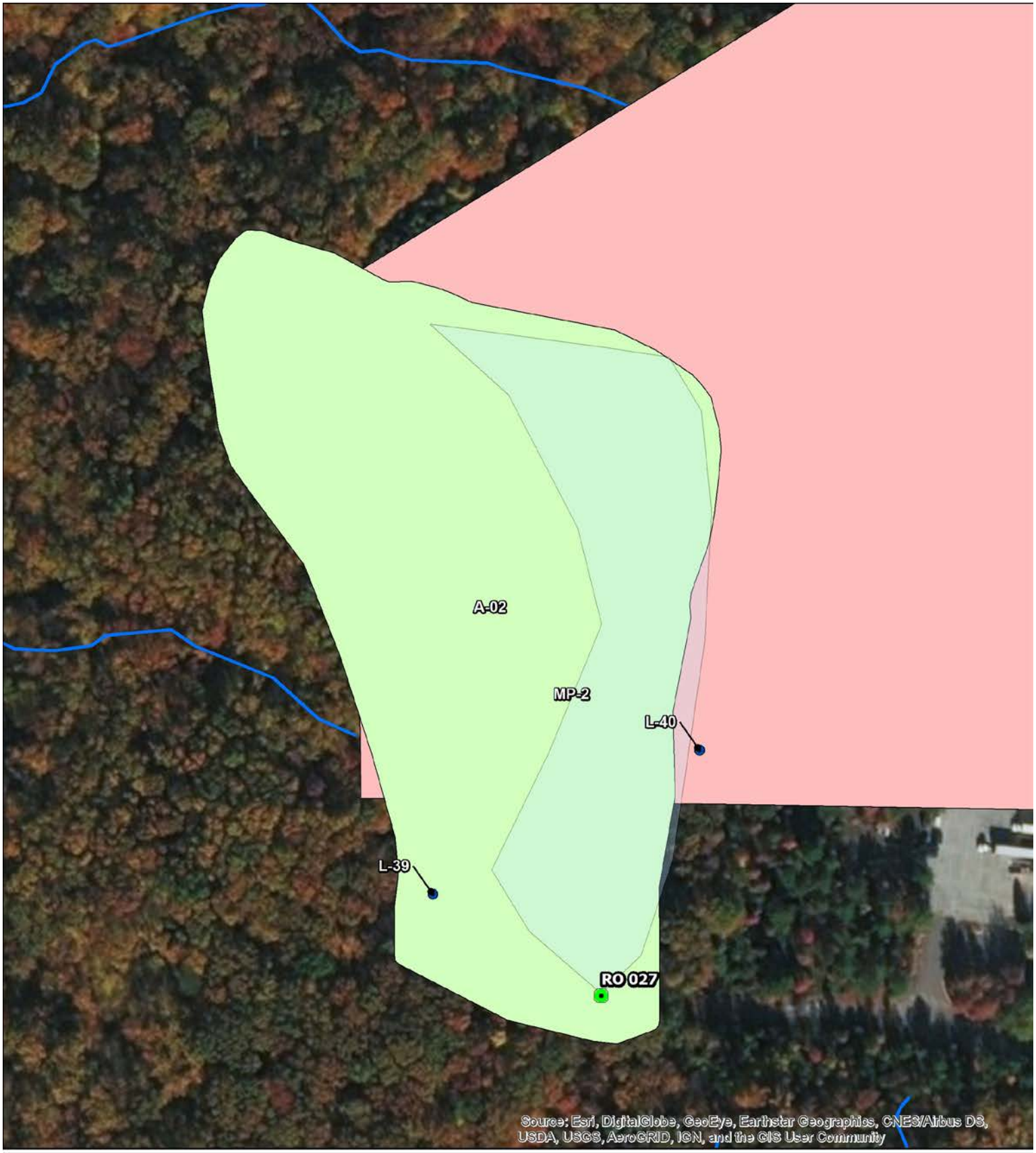
These results were compared to the Virginia Water Quality Criteria (WQC) for surface waters as listed in 9VAC25-260-140. The Freshwater Acute WQC for cadmium, chromium III, copper, lead, nickel, silver, and zinc are a function of total hardness as calcium carbonate (CaCO3) mg/L and the Water Effect Ratio (WER). Attachment A does not require reporting of hardness and therefore this information was not collected. Due to hardness not being collected with this round of sampling, the minimum or conservative value of 25 mg/L, The maximum of 100 mg/L, and the median of 50 mg/L that was used in the waste load allocation analysis completed by VADEQ in 2015 , while the WER was assumed to be ‘1’. Criteria values for the conservative, median, maximum, and average criteria are presented below for comparison. Calculation of WQC for each metal dependent on hardness are presented in Appendix F.

Acute Freshwater and Human Health WQC was not exceeded for any of the detected metals. Although low levels of copper, nickel, and zinc were detected, no other analyte listed in Attachment A was detected in samples.

Table 10: RO-026 Sample Result Summary

Analytes (Dissolved)	Freshwater Acute Criteria (ug/L)1				Human Health (ug/L)	Sample Result (ug/L)
	Conservative[2]	Average[3]	Median[4]	Maximum[5]		
Copper	3.64	–	6.99	13.44	–	**1.37**
Nickel	56.44	–	101.45	182.36	4600	**3.32**
Zinc	36.20	–	65.13	117.18	26000	**9.60**

[1] WQC for cadmium, chromium III, copper, lead, nickel, silver, and zinc are a function of total hardness as calcium carbonate (CaCO3) mg/L and the Water Effect Ratio (WER).
[2]WQC calculated based on a conservative or minimum hardness value of 25 mg/L as defined in 9 VAC 25-260-140.
[3] Historical hardness values are not available for RO-026 therefore "average" values are not considered.
[4] WQC calculated based on the hardness value of 50 mg/L used by VADEQ in 2015 when running a Wasteload Allocation Analysis in April 2015 based on OWP Guidance Memorandum 00-2011.
[5] WQC calculated based on a maximum hardness value of 100 mg/L as defined in 9 VAC 25-260-140.
Bold sample result indicates exceedance of one or more Water Quality Criteria.
Bold WQC that was exceeded based on results



Legend

- RO 027
- Drainage Area RO 027
- Waterway
- Fort Belvoir Border
- SWMU Point - Status: Closed
- SWMU Area - Status: Closed
- SWMU Area - Status: Active

N

Representative Outfall 027

0 0.01250.025 0.05 Miles

SES Construction and Fuel Services LLC

5.26 RO-027 – THEOTE ROAD LANDFILL

The drainage area for Outfall 027 is located in the southwest region of Fort Belvoir. The outfall is located downstream from a catchment pond in a riprap lined culvert just within the tree line. There are no permanent buildings located within this drainage area.

The outfall receives sheet flow run-off from the, now closed, Theote Road Landfill (A02) and portions of a wooded area. The drainage area consists of an open field, mounded in the middle, sloping to a catchment pond with a culvert that ends at the outfall within the tree line.

The eastern boundary of the landfill is bordered by concrete bunkers. The western, northern, and southern portions are heavily wooded with trees and other vegetation marking the boundaries of the site. There is a gate at the entrance to the landfill preventing unauthorized access.

5.26.1 RO-027 – SWMU Evaluation

As shown on the drainage map for RO-027, four SWMUs – A-02, L-39, L-40, and MP-2 - are located within the drainage area of RO-027. SWMU A-02 is administratively closed, but groundwater monitoring is ongoing at this site as part of the investigation activities for SWMU MP-2, which crossing into portions of A-02. SWMUs L-39 and L-40 – both rifle ranges and investigated jointly, are Administratively Closed as both are being administered under Fort Belvoir's Military Munitions Response Program (MMRP). These SWMUs are discussed below.

1. ***SWMU ID:*** A-02

   SWMU Name: Theote Road Landfill

   Indoor/Outdoor: Outdoor

   Type, Function, and History: SWMU A-02, Theote Road Debris Landfill, is described as a 4-acre closed unlined landfill. The final closure report for landfill activities was finalized in October of 1995. From October 1995 through April 2017, Theote Road Landfill was managed under Post Closure Care through Fort Belvoir's Solid Waste Program (Solid Waste Permit # 490) in accordance with Virginia Solid Waste Management Regulations.

   In July 2012, EPA Region 3 approved administrative closure for site A-02 provided the site was being addressed under Fort Belvoir's Solid Waste Program. In February 2015, Fort Belvoir and VADEQ determined that the volatile organic compound (VOC) groundwater contamination detected at the landfill could be properly managed under the Facility's RCRA Subtitle C Site-wide Corrective Action Permit during the investigation of the adjacent/upgradient SWMU MP-2 since one of the plumes found during the RFI at MP-2 spans across the A-02 site.

   In response to the February 2015 determination, VADEQ approved the revocation of Solid Waste Permit (SWP) 490 for Theote Road Debris Landfill in a formal letter dated April 28, 2017. Groundwater monitoring for site A-02 is being managed under investigation activities at SWMU MP-2. Since landfill debris remains at site A-02, Fort Belvoir will administer Land Use Controls to restrict residential development and ensure landfill cap maintenance at the site. Information on MP-2 can be found under the RO-015 SWMU Evaluation.

   Status: Administrative Closure (AC)

   Level of Closure: Industrial

   Regulatory Approval: 07/06/2012

   Statement of Basis: 10/20/2014

   Residual COCs (if applicable):

Groundwater: tetrachloroethene (max 869 ug/L; ave 158 ug/L)

LUCs (if applicable): Inspect cap and stormwater conveyances quarterly & after major storm events; protect integrity of cap; ensure any proposed structures are designed to prevent the accumulation of decomposition gases; maintain the survey plat and deed notation required by VSWMR

2. ***SWMU ID:*** L-39

SWMU Name: Rifle Range 1

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU L-39 was identified as a small arms rifle range that was activated during World War II and was closed in 1953. SWMU L-39 is included in the site boundary of FTBL-014-R-01, Tracy Road Range. Tracy Road Range is currently managed under the installation's Military Munitions Response Program (MMRP). In January 2017, a Decision Document was signed identifying Institutional Controls as the selected remedy for the Tracy Road Range. Institutional controls include residential land use restrictions and an additional safety buffer for the berm areas at FTBL-014-R-01, including the L-39 Rifle Range 1. As the site was appropriately managed under Fort Belvoir's MMRP, SWMU L-39 received regulatory concurrence from US EPA Region 3 for Administrative Closure.

Status: Administrative Closure (AC)

Level of Closure: Managed under Fort Belvoir's Military Munitions Response Program (MMRP)

Regulatory Approval: 07/06//2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable):

Surface Soil: antimony (10.2 mg/kg), copper (221 mg/kg), lead (2,510 mg/kg), zinc (68.8 mg/kg)

Subsurface Soil: antimony (4.04mg/kg), copper (348 mg/kg), lead (2,020 mg/kg), zinc (67.8 mg/kg)

LUCs (if applicable): Prohibit the development and use of the site berms plus a 50-foot buffer around the berms for residential housing, hospitals, schools, childcare facilities, and/or playgrounds; denote Tracy Road Range MRS and record restrictions in the Master Plan; prohibit soil removal from the berms plus a 50-foot buffer; annual inspections and performance monitoring at 5-year reviews to document that ICs have been properly implemented and maintained.

3. ***SWMU ID:*** L-40

SWMU Name: Rifle Range 2

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU L-40 was identified as a small arms rifle range that was activated during World War II and was closed in 1953. SWMU L-40 is included in the site boundary of FTBL-014-R-01, Tracy Road Range. Tracy Road Range is currently managed under the installation's Military Munitions Response Program (MMRP). The 2008 MMRP Site Inspection identified low-level lead contamination in soils. In January 2017, a Decision Document was signed identifying Institutional Controls as the selected remedy for the Tracy Road Range. Institutional controls include residential land use restrictions and an additional safety buffer for the berm areas at FTBL-014-R-01, including the L-40 Rifle Range 2. As the site was appropriately managed under Fort Belvoir's MMRP, SWMU L-40 received regulatory concurrence from US EPA Region 3 for Administrative Closure.

Status: Administrative Closure (AC)

Level of Closure: Managed under Fort Belvoir's Military Munitions Response Program (MMRP)

Regulatory Approval: 07/06//2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable):

Surface Soil: antimony (10.2 mg/kg), copper (221 mg/kg), lead (2,510 mg/kg), zinc (68.8 mg/kg)

Subsurface Soil: antimony (4.04mg/kg), copper (348 mg/kg), lead (2,020 mg/kg), zinc (67.8 mg/kg)

LUCs (if applicable): Prohibit the development and use of the site berms plus a 50-foot buffer around the berms for residential housing, hospitals, schools, childcare facilities, and/or playgrounds; denote Tracy Road Range MRS and record restrictions in the Master Plan; prohibit soil removal from the berms plus a 50-foot buffer; annual inspections and performance monitoring at 5-year reviews to document that ICs have been properly implemented and maintained.

Required Sampling: Based on the presence of PCE in groundwater at SWMU A-02, resulting from the upgradient SWMU MP-2, this evaluation determined that it is necessary for Fort Belvoir to monitor and characterize the discharge from RO-027. Information on MP-2 can be found under the RO-015 SWMU Evaluation.

5.26.2 RO-027 – SWMU Sample Analysis

A sample was collected at RO-027 on January 24, 2019 for the substances noted in Attachment A, "Water Quality Criteria Monitoring". The sample results for constituents detected above the specified Quantification Level (QL) are summarized in Table 11 below. All exceedances of Water Quality Criteria is highlighted in red. The completed Attachment A and laboratory results are provided in Appendix G-7.

These results were compared to the Virginia Water Quality Criteria (WQC) for surface waters as listed in 9VAC25-260-140. The Freshwater Acute WQC for cadmium, chromium III, copper, lead, nickel, silver, and zinc are a function of total hardness as calcium carbonate (CaCO3) mg/L and the Water Effect Ratio (WER). Attachment A does not require reporting of hardness and therefore this information was not collected. Due to hardness not being collected with this round of sampling, the minimum or conservative value of 25 mg/L, The maximum of 100 mg/L, and the median of 50 mg/L that was used in the waste load allocation analysis completed by VADEQ in 2015 , while the WER was assumed to be '1'. Criteria values for the conservative, median, and maximum criteria are presented below for comparison. Calculation of WQC for each metal dependent on hardness are presented in Appendix F.

Acute Freshwater and Human Health WQC was not exceeded for any of the detected metals. Although low levels of copper and zinc were detected, no other analyte listed in Attachment A was detected in samples.

Table 11: RO-027 Sample Result Summary

Analytes (Dissolved)	Freshwater Acute Criteria (ug/L)[1]				Human Health (ug/L)	Sample Result (ug/L)
	Conservative[2]	Average[3]	Median[4]	Maximum[5]		
Copper	3.64	–	6.99	13.44	–	**1.58**
Zinc	36.20	–	65.13	117.18	26000	**2.82**

[1] WQC for cadmium, chromium III, copper, lead, nickel, silver, and zinc are a function of total hardness as calcium carbonate (CaCO3) mg/L and the Water Effect Ratio (WER).
[2]WQC calculated based on a conservative or minimum hardness value of 25 mg/L as defined in 9 VAC 25-260-140.
[3] Historical hardness values are not available for RO-027 therefore "average" values are not considered.
[4] WQC calculated based on the hardness value of 50 mg/L used by VADEQ in 2015 when running a Wasteload Allocation Analysis in April 2015 based on OWP Guidance Memorandum 00-2011.
[5] WQC calculated based on a maximum hardness value of 100 mg/L as defined in 9 VAC 25-260-140.
Bold sample result indicates exceedance of one or more Water Quality Criteria.
Bold WQC that was exceeded based on results

Legend

- RO 028 and 028A
- Drainage Areas RO 028/028A
- Waterway
- SWMU Area - Status: Closed

N

Representative Outfall 028

0 0.02 0.04 0.08 Miles

SES Construction and Fuel Services LLC

5.27 RO-028 – KINGMAN ROAD LANDFILL

The drainage area for ISW Outfall 028 (RO-028) is located in the NE region of Ft. Belvoir. The outfall is located east of Woodlawn Road and south of Kingman Road at a pipe discharging to the stream at the south end of the drainage area. There are no permanent structures or buildings located within this drainage area, but building 2310 is uphill just east of the outfall. Due to a site assessment showing that the location of the outfall does not characterize runoff from the landfill a new sampling point was chosen.

The new sampling location used for this evaluation, referred to as RO-028A, receives run-off from the closed Kingman Road Landfill located in a steep, mostly wooded area east of Woodlawn Road. Most of the storm water run-off moves from the northeast and northwest south towards RO-028. From the outfall water flows south into an unnamed tributary which flows east until convening with Dogue Creek.

5.27.1 RO-028 – SWMU Evaluation

As shown on the drainage map for RO-028, SWMU A-06, the Kingman Road Landfill, is the only SWMU located within the drainage area of RO-028. This SWMU is discussed below.

1. ***SWMU ID:*** A-06

   SWMU Name: Kingman Road Landfill

   Indoor/Outdoor: Outdoor

   Type, Function, and History: SWMU A-06, the Kingman Road Landfill, is an inactive landfill of approximately 7 acres, located south of Kingman Road. It accepted sanitary waste from the 1940s until it was closed in the 1950s. From 1981 to 1983, the facility accepted construction debris. The Phase I and Phase II RFI activities included the review of historical records and aerial photographs, and further delineation of the landfill by test pit investigations, soil borings, groundwater monitoring well installations and sampling, surface water and sediment sampling, and landfill gas (LFG) probe installations and monitoring.

   Analytical results from both the Phase I and Phase II RFIs were evaluated for potential risk to human health and ecological receptors. The human health risk ratio evaluation found that there were no potential concerns for residential and industrial exposure to sub-surface soil. Risk results for groundwater are above the levels of concern identified for SWMU A-06. However, the constituents of potential concern (COPCs) are naturally occurring inorganics and do not reveal a release or impacts from the landfill. The ecological risk evaluation found that the risks do not appear to be of the magnitude that would affect populations of organisms residing in the vicinity of the landfill for either surface water or subsurface soil.

   Based on the results of the Phase II RFI and human health and eco-logical risk screening, No Further Action with administrative land use controls was recommended for this site. US EPA agreed with this recommendation via a letter dated December 7, 2012.

   Status: No Further Action (NFA)

   Level of Closure: Industrial

   Regulatory Approval: 12/7/2012

   Statement of Basis: 10/20/2014

   Residual COCs (if applicable):

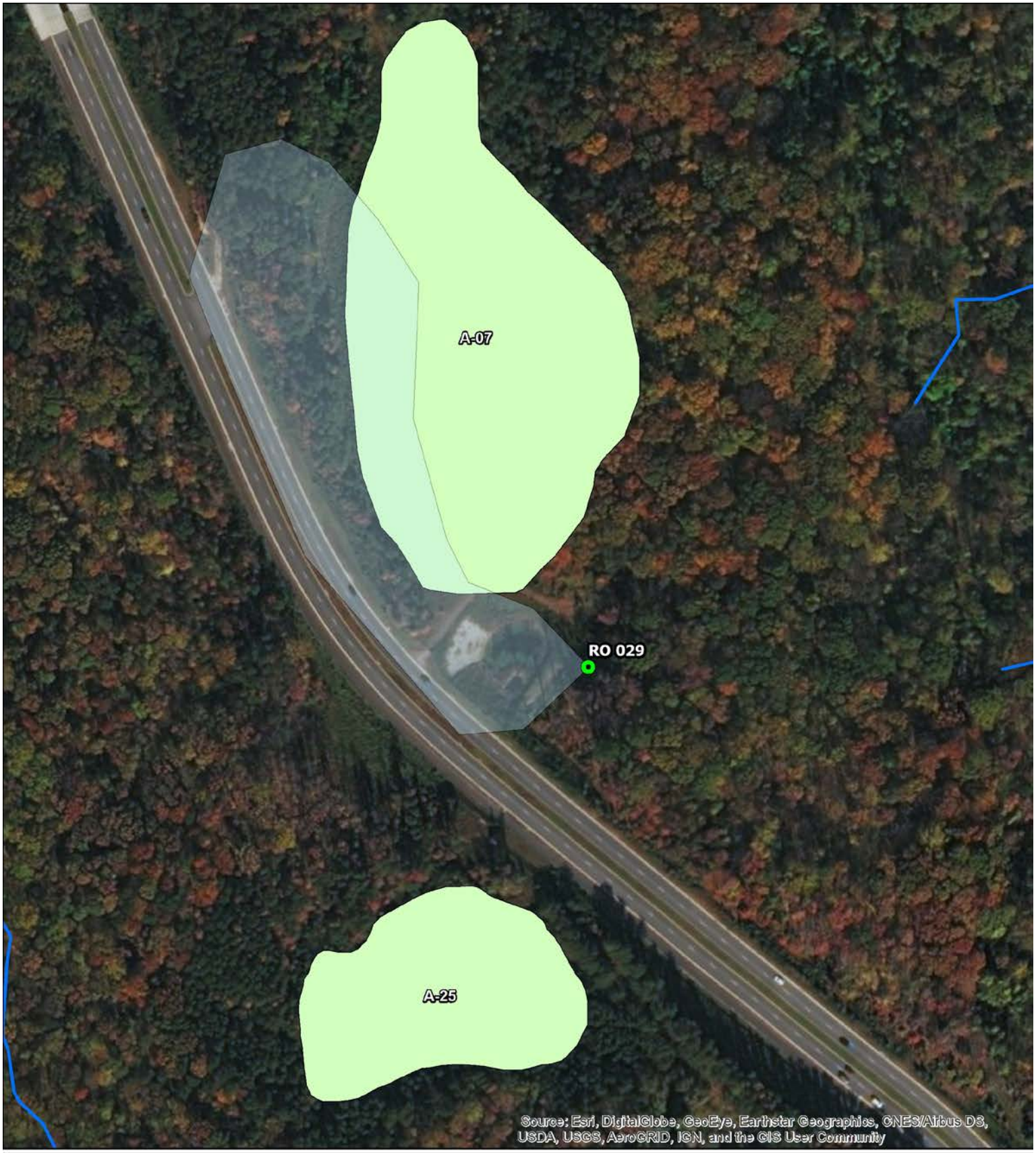
   Soil: arsenic (1.8mg/kg)

   Surface Water: aluminum (4,330 ug/L), iron (3,710 ug/L), and manganese (207 ug/L)

   LUCs (if applicable): Signs to identify the boundaries of known buried waste, warn of the potential hazards, and excavation restrictions; excavation restrictions and notifications to be

implemented through the existing excavation permitting process for the landfill extents and a 150-foot safety notification buffer for construction workers adjacent to the landfill; landfill cap inspections performed annually to ensure the integrity of the landfill caps; record keeping procedures to include regular reporting of the results of inspections.

Required Sampling: Based on the sampling data results and absence of active SWMUs, this evaluation indicated that Fort Belvoir is not required to characterize the stormwater runoff at Outfall RO-028 for the substances noted in Attachment A of the permit.



Legend

- RO 029
- Drainage Areas RO 029
- Waterway
- Fort Belvoir Border
- SWMU Area - Status: Closed

N

Representative Outfall 029

0 0.02 0.04 0.08 Miles

SES Construction and Fuel Services LLC

5.28 RO-029 – MULLIGAN ROAD LANDFILL

The drainage area for ISW Outfall 029 is located in the northeast region of Fort Belvoir. The outfall is located approximately 20 meters east of Jeff Todd Way (the old Mulligan Road) within a riprap lined channel that drains into the catchment basin on the southern portion of the drainage area. There are no permanent buildings or structures located within this drainage area.

The outfall receives run-off from the A07/A25 Closed Mulligan Road Landfill located in a hilly, mostly wooded area east of Jeff Todd Way. Most of the storm water run-off moves from the east-northeast into the grass swale on the western portion of the landfill toward Outfall 029 before entering the catchment basin. From the catchment basin the water flows southwest into an unnamed stream before heading southeast toward an unnamed tributary to tidal portion of Dogue Creek.

5.28.1 RO-029 – SWMU Evaluation

As shown on the drainage map for RO-029, two SWMUs – A-07 and A-25 – are located within the vicinity of RO-029. These landfills were investigated and closed jointly. Both are NFA with LUCs. These SWMUs are discussed below.

1. ***SWMU ID:*** A-07

   SWMU Name: Mulligan Road Landfill

   Indoor/Outdoor: Outdoor

   Type, Function, and History: SWMU A-07 was a former borrow pit which was filled with construction debris, primarily wood waste from the demolition of World War II era barracks at Fort Belvoir, from about 1978 until 1986. The RFI activities consisted of excavation of dig pits for waste delineation, evaluation of the thickness of the landfill cap, soil and groundwater investigation, sediment and surface water sampling, and monitoring of landfill gas. Samples were taken for VOCs, SVOCs, Metals and pesticides and compared to USEPA Region III RBCs and installation background levels. Analytical results from both the Phase I and Phase II RFI ground-water sampling were evaluated for potential risk to human health. The risk evaluation revealed no concerns for human health. Based on the analytical results and risk screening conclusions, no indications of releases or potential releases were identified. Consequently, no further action was recommended for SWMU A-07. However, Land Use Controls (LUCs) are in place to limit development at the site due to existing landfill debris.

   Status: No Further Action (NFA)

   Level of Closure: Industrial

   Regulatory Approval: 12/7/2012

   Statement of Basis: 10/20/2014

   Residual COCs (if applicable):

   Soil: arsenic (2.7 9 mg/kg)

   Groundwater: chloroform (0.3 ug/L), heptachlor (0.063 ug/L), beryllium (4.4 ug/L), cadmium (10 ug/L), iron (5720 ug/L), manganese (809 ug/L), vanadium (20 ug/L), iron (dissolved) (3570 ug/L), manganese (dissolved) (477 ug/L)

   LUCs (if applicable): Signs to identify the boundaries of known buried waste, warn of the potential hazards, and notify of excavation restrictions; excavation restrictions and notifications to be implemented through the existing excavation permitting process for the landfill extents and a 150-foot safety notification buffer for construction workers adjacent to the landfill; notations in Master Plan that future land use and construction for the landfill needs to be consistent with

protection of human health and the environment; landfill cap inspections performed annually to ensure the integrity of the landfill caps; record keeping procedures to include regular reporting of the results of inspections.

2. ***SWMU ID:*** A-25

SWMU Name: Suspected Sanitary/Debris Landfill A

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU A-25 was identified as Suspected Sanitary Landfill A and is located off of what is currently Jeff Todd Way Road on the northern portion of Fort Belvoir. Landfilling at SWMU A-25 reportedly occurred prior to 1940, and the area was again later used for storage or disposal of construction-demolition debris in the late 1970s through the early 1980s. The Phase I RFI activities consisted of excavation of dig pits for waste delineation, evaluation of the thickness of the landfill cap, soil and groundwater investigation, sediment and surface water sampling, and monitoring of landfill gas. Samples were taken for VOCs, SVOCs, Metals and pesticides and compared to USEPA Region III RBCs and installation background levels. Analytical results from both the Phase I and Phase II RFI groundwater sampling were evaluated for potential risk to human health. The risk evaluation revealed no concerns for human health. Based on the analytical results and risk screening conclusions, no indications of releases or potential releases were identified.

Status: No Further Action (NFA)

Level of Closure: Industrial

Regulatory Approval: 12/7/2019

Statement of Basis: 10/20/2014

Residual COCs (if applicable):

Soil: arsenic (7.55 mg/kg)

Groundwater: chloroform (0.79ug/L), bromodichloromethane (0.17ug/L), bis(2-ethylhexyl)phthalate (15.9ug/L), aluminum (5610 ug/L), cadmium (3 ug/L), iron (9100 ug/L), manganese ((1,230ug/L), vanadium (7 ug/L)

LUCs (if applicable): Signs to identify the boundaries of known buried waste, warn of the potential hazards, and notify of excavation restrictions; excavation restrictions and notifications to be implemented through the existing excavation permitting process for the landfill extents and a 150-foot safety notification buffer for construction workers adjacent to the landfill; notations in Master Plan that future land use and construction for the landfill needs to be consistent with protection of human health and the environment; landfill cap inspections performed annually to ensure the integrity of the landfill caps; record keeping procedures to include regular reporting of the results of inspections.

Required Sampling: Based on the site investigations, sampling results, and absence of active SWMUs, this evaluation indicated that Fort Belvoir is not required to characterize the stormwater runoff at Outfall RO-029 for the substances noted in Attachment A of the permit.

Legend

- RO 030
- Drainage Areas RO 030
- Waterway
- Fort Belvoir Border
- SWMU Area - Status: Closed

N

Representative Outfall 030

0 0.01250.025 0.05 Miles

SES Construction and Fuel Services LLC

5.29 RO-030 – POHICK ROAD/TULLY GATE LANDFILL

The drainage area for ISW Outfall 030 is located in the southern region of Fort Belvoir off of Pohick Road and southeast of the Tully Gate security post. The outfall is located in a heavily wooded area 150 meters down a trail that starts approximately 100 meters south of Fort Belvoir's main entrance at Tully Gate right at the tree line. The outfall is an open ditch that runs down a hillside toward an unnamed stream. There are no permanent buildings located within this drainage area.

The outfall receives run-off from the approximately 5 acres, A26 Pohick Road/ Tulley Gate Closed Landfill located in a hilly, heavily wooded area south of Pohick Road. The northern portion of the landfill, closest to Pohick Road, is flat while elevation slopes downward to the south towards an intermittent drainage channel and east towards a perennial stream which flows southwest into Accotink Bay. Signs warning of the potential hazard and notification of excavation restrictions were present along the landfill boundary in accordance with the Land Use Controls for the site. The site is heavily wooded with trees estimated to cover approximately 90–95 percent of the site while the steep slopes along the eastern and southern portion are grassed and the northern portion, along Pohick road is landscaped.

Most of the storm water run-off moves from the northern portion of the site to the south-southwest toward Outfall 030. The outfall is located just off the trail and is easily identifiable by the natural iron oxides that line the drainage ditch the outfall is located in. From the outfall the water flows southwest into an unnamed stream that drains into Accotink Bay.

5.29.1 RO-030 – SWMU Evaluation

As shown on the drainage map for RO-030, one SWMU – A-26 – is located in the drainage area of RO-030 and is NFA with LUCs. This SWMU is discussed below.

1. ***SWMU ID:*** A-26

   SWMU Name: Pohick Road Landfill

   Indoor/Outdoor: Outdoor

   Type, Function, and History: SWMU A-26, Suspected Sanitary Landfill B is a 5.3 acre unlined landfill located near Tulley Gate on Pohick Road. It operated during the mid-1950s as a construction and demolition debris (C&D) landfill as indicted via site investigations. The landfill has been capped with two or more feet of soil across most of the site, and annual inspections have shown that the cap and slopes have been stable with little to no change from year to year. Analytical results from both the Phase I and Phase II RFIs were evaluated and determined that there are no potential concerns for residential or industrial exposure from the SWMU. Consequently, No Further Action for industrial use was recommended for SWMU A-26, since there were no current unacceptable risks to human health or the environment. NFA with Land Use Controls was approved by EPA Region 3 in January 2013. However, Land Use Controls (LUCs) are required to limit development at the site due to existing landfill debris.

   Status: No Further Action (NFA)

   Level of Closure: Industrial

   Regulatory Approval: 1/23/2013

   Statement of Basis: 10/20/2014

   Residual COCs (if applicable):

   Surface Soil: aluminum (9910mg/kg), arsenic (4.2mg/kg), chromium (36.8mg/kg), iron (25400mg/kg), manganese (201mg/kg), vanadium (27.6mg/kg), mercury (1.5mg/kg), dieldrin (200ug/kg), benzo[a]pyrene (160ug/kg), benzo[b]fluoranthene (220ug/kg)

Subsurface Soil: aluminum (12100mg/kg), antimony (5.9mg/kg), arsenic (3.1mg/kg), iron (16200mg/kg), vanadium (27.4mg/kg)

Groundwater: arsenic (5.8 ug/l), iron (74,100ug/l), manganese (330ug/l)

LUCs (if applicable): Signs to identify the boundaries of known buried waste, warn of the potential hazards, and notify of excavation restrictions; excavation restrictions and notifications to be implemented through the existing excavation permitting process for the landfill extents and a 150-foot safety notification buffer for construction workers adjacent to the landfill; notations in Master Plan that future land use and construction for the landfill needs to be consistent with protection of human health and the environment; landfill cap inspections performed annually to ensure the integrity of the landfill caps; record keeping procedures to include regular reporting of the results of inspections.

Required Sampling: Based on the sampling results and absence of active SWMUs, this evaluation indicated that Fort Belvoir is not required to characterize the stormwater runoff at Outfall RO-030 for the substances noted in Attachment A of the permit.

Legend

- RO 031
- Drainage Areas RO 031
- Waterway
- SWMU Point - Status: Closed
- SWMU Point - Status: Active

N

Representative Outfall 031

0 0.01250.025 0.05 Miles

SES Construction and Fuel Services LLC

5.30 RO-031 – BELVOIR NGA REFLECTING POND 6

The drainage area for Outfall 031 is part of an 807-acre tract located 1.5 miles northwest of the main post of Fort Belvoir. The outfall is at the outlet/riser located in the northwest portion of a catchment pond that is situated 15 meters from the south wall of building 1500. Stormwater leaving the catchment basin/pond travels northwest where it discharges into Accotink Creek.

The catchment basin/reflecting pond in which Outfall 031 is located receives stormwater run-off from multiple pipes and culverts within the surrounding area. The buildings that are within this area do not conduct industrial operations that are of concern. The pond itself is of concern due to the reflective agents added as well as other products used to control algae growth and contribute to the aesthetics of the pond. The pond is checked periodically for pH and alkalinity.

5.30.1 RO-031 – SWMU Evaluation

As shown on the drainage map for RO-031, SWMU AOPC-2 is the only SWMU located within the drainage area of RO-031, which is located at Fort Belvoir North Area (FBNA), formerly known as Engineering Proving Grounds (EPG). AOPC-02 was investigated as part of the UAO for FBNA.

1. ***SWMU ID:*** AOPC-2

   SWMU Name: Former Gasoline Tanks

   Indoor/Outdoor: Outdoor

   Type, Function, and History: AOPC-02 is referred to as "Former Gasoline Tanks" and consisted of two gasoline tanks that were present between 1947 and 1951 on the eastern side of Accotink Creek. To address the environmental constraints on the EPG property, Fort Belvoir prepared an Environmental Investigation Plan (EIP) for each site in accordance with the U.S. EPA Region III Administrative Order 3013 for environmental investigations. The EIP for the Former Gasoline Tanks (AOPC-02) was approved by the EPA in the fall of 2006. Field sampling occurred in November and December of 2006 and included the advancement of three soil borings/temporary monitoring wells with subsequent collection of soil and groundwater samples. Metals detected in soils (arsenic, chromium, and iron) were found to be due to natural background concentration levels. Results from the soil and groundwater samples indicated that there was no direct impact from the tanks to the environment.

   Status: No Further Action (NFA)

   Level of Closure: UU/UE

   Regulatory Approval: 10/4/2007

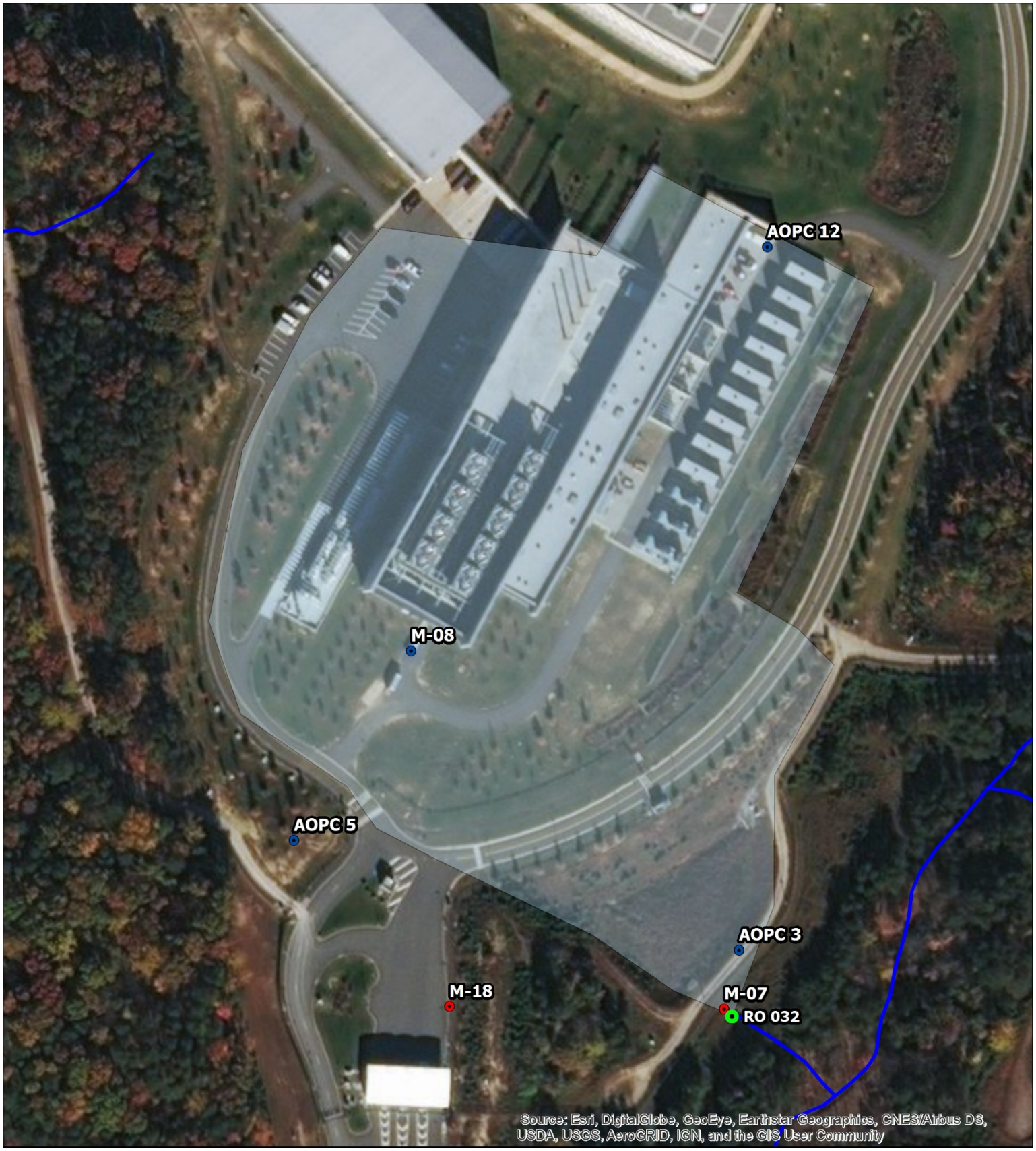
   Statement of Basis: 7/27/2017 (UAO Closure Letter)

   Residual COCs (if applicable):

   Soil: arsenic (3.6 mg/kg), chromium (246 mg/kg), iron (26,600 mg/kg)

   LUCs (if applicable): N/A

Required Sampling: Based on the sampling data results and absence of active SWMUs, this evaluation indicated that Fort Belvoir is not required to characterize the stormwater runoff at Outfall RO-031 for the substances noted in Attachment A of the permit.



Legend

- RO 032
- Drainage Areas RO 032
- Waterway
- SWMU Point - Status: Closed
- SWMU Point - Status: Active

N

Representative Outfall 032

0 0.0125 0.025 0.05 Miles

SES Construction and Fuel Services LLC

5.31 RO-032 – BELVOIR NGA POND 8

The drainage area for Outfall 032 is part of an 807-acre tract located 1.5 miles northwest of the main post of Fort Belvoir. The outfall is at the outlet/riser located in the southeast portion of a catchment pond, pond 8, that is situated directly south from building 1504. The drainage area of ISW Outfall 032 is located northwest of a catchment pond bordered by Geoint Road and a forested area. Runoff from portions of Buildings 5100, 5103, and 5104 is transported to a treatment chain of catchment ponds via pipes. The chained ponds are then connected via pipes to the catchment pond, pond 8, East of Geoint Drive.

Building 5104 is used as a hazardous material and waste storage location. On the west side of building 5104 there is a bermed fueling pad for the fuel trucks just west of seven (7) above ground storage tanks. The tanks are used to support and fuel twelve (12) diesel generators located on the northeast corner of the building which feed four (4) internal boilers. The south side of the building is used for temporary and seasonal storage of materials and equipment. This area is equipped with covered and lined sheds for storage.

Signage warns to close the stormwater drain prior to fueling. If there is a spill, a contact person and phone number is provided on the sign. Normally, this tank is kept at 85% of maximum capacity when not supplying fuel to other tanks. All the tanks are located under a skeleton canopy and inside a 3 feet tall bermed area. A grate for stormwater drainage is located inside the bermed area, which contains two (2) Enviro-Drain filters designed to gel upon contact with hydrocarbons. Water from this drain goes into a nearby catchment pond before going to the catchment pond which feeds the outfall. Spill kits and spills signs were located close by.

5.31.1 RO-032 - SWMU Evaluation

As shown on the drainage map for RO-032, five SWMUs are present within the drainage area of RO-032, which is located on FBNA, formerly known as EPG. These SWMUs were investigated as part of the UAO. Three SWMUs received NFA approval, and two M-07 and M-18 SWMUs are Administratively Closed under RCRA as they are being managed under CERCLA authority. These two SWMUs are being evaluated for groundwater remedies under site FTBL-66 being implemented under CERCLA, with VADEQ providing regulatory review. The expected final remedy for these sites is monitored natural attenuation of contaminants with long-term monitoring of groundwater and LUCs to restrict groundwater use. These SWMUs are discussed below.

1. ***SWMU ID:*** AOPC-3

   SWMU Name: N/A

   Indoor/Outdoor: Outdoor

   Type, Function, and History: AOPC-3 is characterized by two small areas, A and B, which are described as the former burning slabs associated with the fire training area. Area A is an approximately 40 feet by 40 feet former square concrete pad, which was located approximately 150 feet east of Building 2040/5040. This pad was demolished and removed in December 2007. Once the slab was removed, an area measuring 50 feet by 50 feet was excavated to a depth of approximately 2 feet. Approximately 220 cubic yards of soil and 140 cubic yards of concrete were removed from AOPC-3A during the Initial Abatement Measure. Soil samples were taken following excavation.

   Historical aerial photographs suggest that the now former concrete slab at Area B, originally located approximately 250 feet south of Building 2040/5040, and was reportedly of similar size and shape to Area A. The pad was in longer in existence during investigations. The approved EIP (December 2006) for AOPC-3A and B specified the advancement of four shallow soil borings in the area surrounding the concrete slab at AOPC-3A with collection of four shallow surface soil

samples. One additional shallow soil boring and sample were taken from the former AOPC-3B area. In addition, three soil borings/temporary monitoring wells in the former AOPC-3B area were advanced with subsequent collection of soil and groundwater samples.

Of the detected analytes only arsenic and dioxins were detected at concentrations which exceeded the U.S. EPA Region III RBC standards for residential soils. The arsenic levels were found to be below background levels and dioxin levels meet requirements for industrial use. Bis(2-ethylhexyl) phthalate was the only analyte detected above screening levels in groundwater but is also a common artifact from laboratory analysis. Detections were found to be non-substantial since field blanks also showed similar results. The site received concurrence for NFA from the EPA in December 2007.

Status: No Further Action (NFA)

Level of Closure: Industrial

Regulatory Approval: 10/04/2007

Statement of Basis: 7/27/2017 (UAO Closure Letter)

Residual COCs (if applicable):

Soil: arsenic (2.5 mg/kg), dioxins & furans TEF cumulative concentration (12.86 pg/g)

Groundwater: bis(2-ethylhexyl) phthalate (31 ug/L)

LUCs (if applicable): None

2. ***SWMU ID:*** AOPC-12

SWMU Name: N/A

Indoor/Outdoor: Outdoor

Type, Function, and History: AOPC-12 is characterized by two areas, A and B. Area A (AOPC-12A) is described as the location of were two removed USTs once sat. Area B (AOPC-12B) is the area around the former structure used for managing the USTs and associated piping (Building 2042). In the spring of 2006, the site of the former Building 2042 was inspected and found to be a 20–30 foot deep hole with standing water. Additionally, during the surveillance of the Building 2042 site in the spring of 2006, two pipes were noticed protruding out of the ground (AOPC-12A) to the east of the former Building 2042. These pipes looked like fill ports and vent pipes for the USTs

Field activities at AOPC-12 A and B were initiated in 2006. Activities included the removal of fuels from the tanks associated with AOPC-12A, removal of the tanks and associated piping, excavation of adjacent soils, and confirmation sampling for soils and groundwater in the vicinity of both AOPC-A and B. Activities resulted in the removal of an approximately 4,000 gal diesel tank, a 100 gal gasoline tank, piping associated with the tanks, and a concrete slab. Confirmation sampling done during tank removal indicted that soils had been impacted therefore excavation of impacted soils and removal of associated building (AOPC-B) and piping was completed in August 2007.

Three (3) soil boring samples and three (3) groundwater samples were collected at both AOPC-12A and AOPC-12B, and analyzed for metals, volatile organic compounds, and semi volatile organic compounds. With the exception of arsenic (below background) at both AOPC-12A and AOPC-12B, none of the detected COCs in the soil samples were above the U.S. EPA Region III RBC criteria for both industrial and residential soils. The site received concurrence for NFA from EPA and tank closure from VADEQ in 2007.

Status: No Further Action (NFA)

Level of Closure: UU/UE

Regulatory Approval: 10/30/2007

Statement of Basis: 7/27/2017

Residual COCs (if applicable):

Soil: arsenic (3.7 mg/kg)

Groundwater: Chloroform (1 ug/L)

LUCs (if applicable): None

3. ***SWMU ID:*** M-07

SWMU Name: Inactive Fire Equipment Test Area

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU M-07 is located on the eastern portion of the Engineer Proving Ground (EPG), an 820-acre tract located approximately 1.5 miles northwest of the main post of Fort Belvoir. This area is more commonly referred to as Belvoir North Area. A Unilateral Administrative Order (UAO) was issued by the EPA in September 2007 requiring the Department of the Army to investigate SWMUs, Areas of Potential Concern (AOPCs), and other areas where releases containing hazardous constituents occurred at EPG. SWMU M-07 is described as a fire equipment testing area where a tank with a fuel/water mixture was ignited, then suppressed, with the remaining fluids drained to a creek. Historic Aerial Photograph from 2002 that indicates the general location of SWMUs M-7/M-18 relative to Building 2037/5037. The fire equipment testing area reportedly consisted of the circular concrete pad and adjacent abandoned piping associated with the USTs.

Previous samples were collected from two soil borings with nine soil samples and five surface soil samples at SWMU M-07 in 1990 as a part of the Phase III EBS. Detected levels of total petroleum hydrocarbons (TPH) greater than the Virginia DEQ clean fill standard of 100 mg/kg were found in seven of fourteen samples.

Investigation of M-07/M-18 started in November 2006, which involved the installment of eight (8) temporary monitoring wells were installed at SWMUs M-7/M-18. Field activities at M-07/M-18 were performed from December 3rd through 15th 2006. Activities included the advancement of eight (8) soil borings/temporary monitoring wells and the collection of soil and groundwater samples. The five (5) existing monitoring wells at SWMUs M-7/M-18 were resampled as part of this investigation. Nine (9) sub-surface soil samples with one (1) duplicate sample and thirteen (13) groundwater samples were collected from within SWMU M-07/M-18 and analyzed for metals, volatile organic compounds, and semi volatile organic compounds.

The sub-surface soil samples detected analyte concentrations which exceeded the U.S. EPA Region III RBC values for residential soils for arsenic, manganese, and thallium. Arsenic concentrations in soil samples collected at SWMUs M-7/M-18 also exceed the industrial RBC however; arsenic concentrations were well within the measured Fort Belvoir background levels. The detection of elevated concentrations of arsenic and other metals throughout EPG suggests that these concentrations represent normal background levels and not contamination related to historical activities at the site. The manganese and thallium concentrations in one soil sample collected from SB08 exceeded the residential RBC values but not the industrial RBC values. It is assumed this is an isolated occurrence and these analytes are not considered potential COCs related to historical activities at the site.

Groundwater samples detected analytes for only arsenic, iron, manganese, bis(2 ethylhexyl) phthalate, and naphthalene that exceeded their corresponding U.S. EPA Region III RBC standards for tap water. Concentrations of benzene, cis-1, 2-dichloroethene, and vinyl chloride exceeded their corresponding U.S. EPA MCL values. The presence of these detected analytes indicate that a release has occurred from the abandoned USTs or associated piping and associated

fire training activities at the site. Fort Belvoir recommends further assessment to delineate the extent of hydrocarbon contamination in the area surrounding SWMUs M-7/M-18.

The site received concurrence that remedy has been fully implemented for soils in 2007, but the groundwater would still need to be addressed. SWMU M-07 requires further action for groundwater only, and the expected final remedy is monitored natural attenuation of contaminants with long-term monitoring of groundwater and LUCs to restrict groundwater use. The clean-up activities are being implemented under CERCLA authorities, with VDEQ providing regulatory review under the larger all-encompassing site FTBL-66. FTBL-66 Data Gap sampling has been completed, and Final Data Gap Sampling report is pending VADEQ approval.

Status: Administrative Closure (AC)

Level of Closure: Managed under CERCLA Authority (groundwater only)

Regulatory Approval: 11/24/2015

Statement of Basis: 7/27/2017

Residual COCs (if applicable):

Soil: Arsenic (0.43 mg/kg), Manganese (1,600 mg/Kg) and Thallium (5.5 mg/Kg)

Groundwater: 1,2,4-trimethylbenzene (58 ug/L), arsenic (0.045 ug/L), iron (11,000 ug/L), manganese (730 ug/L), benzene (0.34 ug/L), bis(2-ethylhexyl)phthalate (4.8 ug/L) and naphthalene (6.5 ug/L).

LUCs (if applicable): Restricted groundwater use

4. ***SWMU ID:*** M-08

SWMU Name: Abandoned Aluminum Drums Excavation Area

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU M-08 was an exterior area used for burial (storage) of 18 empty aluminum 55-gallon drums northwest of Building 2037. It is a roughly 20 foot by 10 foot clearing in the scrubby forest vegetation located in the central part of EPG. EPG personnel believe the drums were buried empty in the early 1970s. According to facility information, at some point in 1985 these drums were excavated and moved for storage approximately 50 feet west of the excavation area. Wipe samples collected in 1990 confirmed that some of the drums had once contained inhibited red-fuming nitric acid. However, in all samples taken in the area of excavation and in the area where the drums were staged after excavation, nitrogen compounds were found to be below detection limits. During this study total petroleum hydrocarbons (TPH) of an unknown origin were detected above Virginia standards in the surface soil samples collected where the drums were stored after excavation, but not where the drums had been previously buried. The high levels of TPH in these samples indicate that at least some of the drums contained petroleum product at one time.

In a September 2005 site investigation, an approximately 20 foot by 10 foot clearing and a concrete retaining wall in the forest cover were observed and appear to be the former drum excavation area. The role of the retaining wall in the drum area is unknown, but it is possible that it was related to loading/unloading activities or as an erosion control measure. A few small pieces of metal construction debris were observed. No visibly stained soils, stressed vegetation, or unusual odors were observed.

Field activities at SWMU M-08 were performed from November 29 to December 7, 2006. Activities included the advancement of five (5) soil borings, installation of three (3) groundwater monitoring wells, and the collection of soil and groundwater samples. With the exceptions of arsenic and iron in soils, none of the detected analytes were above their corresponding RBC residential soil criteria. Arsenic concentrations were well within the measured Fort Belvoir

background levels. The highest iron concentration was found to be above residential criteria but below the industrial level. Bis(2-ethylhexyl) phthalate was the only analyte detected above screening levels in groundwater but is also a common artifact from laboratory analysis. Detections were found to be non-substantial since field blanks also showed similar results. The site received concurrence for NFA from the EPA in October 2007.

Status: No Further Action (NFA)

Level of Closure: UU/UE

Regulatory Approval: 10/04/2007

Statement of Basis: 7/27/2017

Residual COCs (if applicable):

Soil: arsenic (3 mg/kg), iron (90,400 mg/kg)

Groundwater: bis(2-ethylhexyl) phthalate (8.8 ug/L)

LUCs (if applicable): None

5. ***SWMU ID:*** M-18

SWMU Name: Former Concrete Burn Pad

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU M-18 is located on the eastern portion of the Engineer Proving Ground (EPG), an 820-acre tract located approximately 1.5 miles northwest of the main post of Fort Belvoir. A Unilateral Administrative Order (UAO) was issued by the EPA in September 2007 requiring the Department of the Army to investigate SWMUs, Areas of Potential Concern (AOPCs), and other areas where releases containing hazardous constituents occurred at EPG. SWMU M-18 is located near SWMU M-07 and was the site of 3 abandoned underground storage tanks (USTs) of no more than 10,000 gallon capacity located south of Building (former)2037/ (current) 5037.

The tanks were reported as having stored flammable liquids such as diesel fuel and were in use from 1952 to 1973. A concrete pad, USTs, and some associated piping was removed in 1995. Soil samples indicated that TPH levels were above VADEQ action levels. Additional piping and impacted soil was removed and properly disposed of in 2007. EPA determined that the requirements of the UAO were satisfied and terminated it in July 2017.

Investigation of M-07/M-18 started in November 2006, which involved the installment of eight (8) temporary monitoring wells were installed at SWMUs M-7/M-18. Field activities at M-07/M-18 were performed from December 3rd through 15th 2006. Activities included the advancement of eight (8) soil borings/temporary monitoring wells and the collection of soil and groundwater samples. The five (5) existing monitoring wells at SWMUs M-7/M-18 were resampled as part of this investigation. Nine (9) sub-surface soil samples with one (1) duplicate sample and thirteen (13) groundwater samples were collected from within SWMU M-07/M-18 and analyzed for metals, volatile organic compounds, and semi volatile organic compounds.

The sub-surface soil samples detected analyte concentrations which exceeded the U.S. EPA Region III RBC values for residential soils for arsenic, manganese, and thallium. Arsenic concentrations in soil samples collected at SWMUs M-7/M-18 also exceed the industrial RBC however; arsenic concentrations were well within the measured Fort Belvoir background levels. The detection of elevated concentrations of arsenic and other metals throughout EPG suggests that these concentrations represent normal background levels and not contamination related to historical activities at the site. The manganese and thallium concentrations in one soil sample collected from SB08 exceeded the residential RBC values but not the industrial RBC values. It is assumed this is an isolated occurrence and these analytes are not considered potential COCs

related to historical activities at the site. Groundwater samples detected analytes for only arsenic, iron, manganese, bis(2 ethylhexyl)phthalate, and naphthalene that exceeded their corresponding U.S. EPA Region III RBC standards for tap water. Concentrations of benzene, cis-1, 2-dichloroethene, and vinyl chloride exceeded their corresponding U.S. EPA MCL values. The presence of these detected analytes indicate that a release has occurred from the abandoned Underground Storage Tank (USTs) or associated piping and associated fire training activities at the site. Fort Belvoir recommends further assessment to delineate the extent of hydrocarbon contamination in the area surrounding SWMUs M-7/M-18.

SWMU M-18 requires further action for groundwater only, and the expected final remedy is monitored natural attenuation of contaminants with long-term monitoring of groundwater and LUCs to restrict groundwater use. The clean-up activities are being implemented under CERCLA authorities, with VADEQ providing regulatory review under FTBL-66. FTBL-66 Data Gap sampling has been completed, and Final Data Gap Sampling report is pending VADEQ approval.

Status: Administrative Closure (AC)

Level of Closure: Managed under CERCLA Authority (groundwater only)

Regulatory Approval: 11/24/2015

Statement of Basis: 7/27/2017

Residual COCs (if applicable):

Soil: Arsenic (0.43 mg/kg), Manganese (1,600 mg/Kg) and Thallium (5.5 mg/Kg)

Groundwater: 1,2,4-trimethylbenzene (58 ug/L), arsenic (0.045 ug/L), iron (11,000 ug/L), manganese (730 ug/L), benzene (0.34 ug/L), bis(2-ethylhexyl)phthalate (4.8 ug/L) and naphthalene (6.5 ug/L).

LUCs (if applicable): Restricted groundwater use

Required Sampling: All SWMUs in this outfall drainage area are AC or NFA, and therefore, Fort Belvoir is not required to characterize the stormwater runoff at Outfall RO-032 for the purposes of this permit requirement. However, due to the historical environmental contamination and the ongoing groundwater monitoring, Fort Belvoir opted to sample RO-032 in order to determine if any of these SWMUs have a potential to impact stormwater.

5.31.2 RO-032 – SWMU Sample Analysis

A sample was collected at RO-032 on April 19, 2019 for the substances noted in Attachment A, "Water Quality Criteria Monitoring". The sample results for constituents detected above the specified Quantification Level (QL) are summarized in Table 12 below. All exceedances of Water Quality Criteria is highlighted in red. The completed Attachment A and laboratory results are provided in Appendix G-8.

These results were compared to the Virginia Water Quality Criteria (WQC) for surface waters as listed in 9VAC25-260-140. The Freshwater Acute WQC for cadmium, chromium III, copper, lead, nickel, silver, and zinc are a function of total hardness as calcium carbonate (CaCO3) mg/L and the Water Effect Ratio (WER). Due to hardness not being collected with this round of sampling, the minimum or conservative value of 25 mg/L, The maximum of 100 mg/L, and the median of 50 mg/L that was used in the waste load allocation analysis completed by VADEQ in 2015 , while the WER was assumed to be ‘1’. Criteria values for the conservative, median, maximum, and average criteria are presented below for comparison. Calculation of WQC for each metal dependent on hardness are presented in Appendix F.

Acute Freshwater WQC was exceeded for copper and zinc for the conservative hardness. WQC was only exceeded for copper when looking at the median hardness as used by VADEQ. Although the WQC was exceeded for copper, no other analyte listed in Attachment A was detected in samples.

Table 12: RO-032 Sample Result Summary

Analytes (Dissolved)	Freshwater Acute Criteria (ug/L)[1]				Human Health (ug/L)	Sample Result (ug/L)
	Conservative[2]	Average[3]	Median[4]	Maximum[5]		
Antimony	–	–	–	–	640	**0.938**
Copper	***3.64***	–	***6.99***	***13.44***	–	**14.1**
Nickel	56.44	–	101.45	182.36	4600	**1.08**
Zinc	***36.20***	–	65.13	117.18	26000	**37.0**

[1] WQC for cadmium, chromium III, copper, lead, nickel, silver, and zinc are a function of total hardness as calcium carbonate (CaCO3) mg/L and the Water Effect Ratio (WER).
[2] WQC calculated based on a conservative or minimum hardness value of 25 mg/L as defined in 9 VAC 25-260-140.
[3] Historical hardness values are not available for RO-032 therefore "average" values are not considered.
[4] WQC calculated based on the hardness value of 50 mg/L used by VADEQ in 2015 when running a Wasteload Allocation Analysis in April 2015 based on OWP Guidance Memorandum 00-2011.
[5] WQC calculated based on a maximum hardness value of 100 mg/L as defined in 9 VAC 25-260-140.
Bold sample result indicates exceedance of one or more Water Quality Criteria.
Bold WQC that was exceeded based on results

Legend

- RO 033
- Drainage Areas RO 033
- Waterway
- SWMU Point - Status: Closed
- SWMU Area - Status: Closed

N

Representative Outfall 033

0 0.00750.015 0.03 Miles

SES Construction and Fuel Services LLC

5.32 RO-033 – 249TH MOTORPOOL

The drainage area for Representative Outfall 033 (RO-033) is located in the southern region of Fort Belvoir. The Outfall is located at the outfall of a newly installed bio-retention pond just outside the southern fence line of the 249th Prime Power Motorpool, operated by Charlie Company.

The drainage area for ISW RO-033 encompasses approximately half of the Motorpool which includes a paved area housing vehicles, generators, a material storage area, a fuel dispenser, and a tented maintenance area. The Motorpool is bordered by Pohick Road to the North and Theote Road to the East. Heavily forested areas cover the western and southern sides of the site.

The outfall from the level 1 bio-retention filter receives run-off via sheet flow from the bermed paved area to the north and northwest. The outfall discharges to an unnamed tributary located to the south before heading west towards Accotink Creek and then Accotink Bay.

Industrial activities occur throughout the lot with the most significant source being in the eastern portion of the drainage area where a covered maintenance and material handling area are located.

5.32.1 RO-033 – SWMU Evaluation

As shown on the drainage map for RO-033, three SWMUs are located within the drainage area of RO-033. One SWMU is NFA UU/UE, and two SWMUs are AC UU/UE. All three SWMUs are located in or near Building 1132, the Power Unit School/ Former Defense Property Disposal Office (DPDO) Storage Area, and Building 1133, a nearby storage building. These SWMUs are discussed below.

1. ***SWMU ID:*** N-06
   SWMU Name: Former DPDO Storage UST
   Indoor/Outdoor: Outdoor
   Type, Function, and History: SWMU N-06 was identified as a waste oil UST storage area at the Power Unit School/ Former Defense Property Disposal Office (DPDO) Storage Area (Building 1132). In 1997, 6 USTs were removed or abandoned in place. The approved Corrective Action Plan was implemented in the spring of 2001 and a bio-venting system was operated from April 2001 to March 2003. A closure report was prepared and VDEQ issued a letter of concurrence in April 29, 2003. NFA was approved by EPA Region 3 for all land use scenarios; thus, no land use controls are required.
   Status: No Further Action (NFA)
   Level of Closure: UU/UE
   Regulatory Approval: 9/21/2012
   Statement of Basis: 10/20/2014
   Residual COCs (if applicable):
   Soil: TPH (15000mg/kg)
   LUCs (if applicable): N/A

2. ***SWMU ID:*** N-09
   SWMU Name: Former DPDO Storage
   Indoor/Outdoor: Indoor
   Type, Function, and History: SWMU N-09 was identified in 1991 as a battery storage area located inside Building 1132. Subsequent site visits in 1997 and 2005 indicate that this was a

battery testing/charging station and not a battery storage area. No evidence of release or spill was ever noted, and review of available historical records indicates that no release or spill has occurred at this site. As such, SWMU N-09 received regulatory concurrence for Administrative Closure in 2012.

Status: Administrative Closure (AC)

Level of Closure: UU/UE

Regulatory Approval: 7/6/2012

Statement of Basis: 10/20/2014

Residual COCs (if applicable): N/A

LUCs (if applicable): N/A

3. ***SWMU ID:*** N-11

SWMU Name: Power Unit School/Former DPDO Storage Area

Indoor/Outdoor: Outdoor

Type, Function, and History: SWMU N-11 was described in 1991 as a storage location for 55-gallon drums containing dirt contaminated by fuel, as well as drums containing waste oil. A subsequent visual site inspection in 2005 noted that it was at that time a storage area for empty drums. Historical records from SWMU N-11 indicate that there are no documented releases or spills of hazardous materials to the environment related to this unit. As such, SWMU N-11 received regulatory concurrence for Administrative Closure in 2011.

Status: Administrative Closure (AC)

Level of Closure: UU/UE

Regulatory Approval: 1/3/2011

Statement of Basis: 10/20/2014

Residual COCs (if applicable): N/A

LUCs (if applicable): N/A

Required Sampling: Based on the sampling results, UU/UE closures, and absence of active SWMUs, this evaluation indicated that Fort Belvoir is not required to characterize the stormwater runoff at Outfall RO-033 for the substances noted in Attachment A of the permit.

6 REPRESENTATIVE OUTFALL EVALUATION RESULTS

This evaluation of the RO drainage areas for the presence of SMWUs as required under Part I.C.3.a of the Fort Belvoir Individual VPDES for Discharges of Industrial Stormwater (ISW) Major Permit No. VA0092771 consisted of a review of Fort Belvoir's RCRA information repositories as well as Fort Belvoir's Hazardous Waste Management Permit for Storage and Corrective Action Module, as discussed in Section 4. The Permit defines an active SWMU as follows:

> *"For purposes of this permit, an active SWMU is one that has been deemed active under Resource Conservation and Recovery Act (RCRA) regulations and is active as of the effective date of this permit"*

The analysis performed determined that 127 Historical SWMUs were located within drainage areas of ROs on the installation. Seven (7) of these SMMUs were found to be active under RCRA as described above. Although the permit required evaluation of SWMUs was only inclusive of sites covered under RCRA, information repositories for Fort Belvoir's PMP and CERCLA programs were also referenced as part of this evaluation to determine status and environmental conditions at 14 sites that were AC because they were being managed under a separate authority.

A literature review completed for the 127 Historical SWMUs documented the following:

1. A description of the historical SWMU;
2. Whether the SWMU is located inside or outside of a building;
3. The type and function of the SWMU during the 1988 RFA;
4. To the extent available, information on wastes that are/were managed or released at each SWMU
5. The SWMU investigation history;
6. Its present status under RCRA – active or closed;
    a. If the SWMU is active, whether it requires further investigation or if it is undergoing corrective measures by the Restoration Group;
    b. If the SWMU is closed, the type of closure – AC, NFA – and the level of closure – UU/UE or Industrial;
    c. If the SWMU is closed, the date of regulatory concurrence for SWMU closure and Statement of Basis;
    d. Where applicable, the terms of the LUCs for SWMU closure;
    e. Where applicable, sampling data for soil, sediment, groundwater, and/or surface water for residual contaminants of concern (COCs) known to be found within a SWMU site.

After determining the status of the identified SWMUs, as of the effective date of the ISW Permit, a recommendation was made for the need for stormwater characterization based on Part I.C.3.b of the Permit which states the following:

> *To characterize the stormwater runoff from active SWMUs within the drainage area of those outfalls identified in Part I.A.1 – Part I.A.32 of this permit, the permittee shall monitor the discharge from any outfall identified as having an active SWMU (as defined above) within its drainage area for the substances noted in Attachment A of this VPDES permit. Monitoring for the substances noted in Attachment A, "Water Quality Criteria Monitoring" are to be conducted according to the indicated analysis number, quantification level, sample type and frequency.*

The seven active SWMUs with a RO drainage area are A-05, A-08, and A-09 which are currently undergoing corrective measures and L-09, MP-2, MP-10, and MP-11 which are undergoing RCRA investigations. As required by this evaluation, Fort Belvoir sampled the outfalls associated with these SWMUs, which included RO-005, RO-007, RO-015, RO-026 and RO-027.

Although not a requirement of this permit, Fort Belvoir also conducted a case-by-case analysis of the 14 AC sites that are being addressed under a separate authority mechanism as well as the 23 sites that are closed to Industrial standards to determine if any of these SWMUs have a potential stormwater impact based on sampling for analytes in Attachment A when compared to Water Quality Criteria (WQC). As a result of this analysis, Fort Belvoir identified and sampled four (4) additional outfalls – RO-004, RO-020, and RO-032 – where groundwater monitoring is ongoing under VSWMR, PMP, or CERCLA. Table 13 provides a summary of the evaluation results

Table 13: Summary of SWMU Evaluation by Outfall

Outfall	SWMUs in Outfall Drainage Area	Detections above WQC
RO-001	No SWMUs present in this area	n/a
RO-002	C-04, C-05, E-01, E-04, E-07, L-04, L-12, L-28, N-20	n/a
RO-003	D-02, DAAF-1, E-12, K-01, K-02, K-03, K-04, K-05, L-27	n/a
RO-004	**A-01**, A-20, A-21	Metals
RO-005	**MP-11**, N-10	Metals
RO-006	No SWMUs present in this area	n/a
RO-007	A-04, A-23, **L-09**, **MP-10**, N-12	n/a
RO-008	No SWMUs present in this area	n/a
RO-009	A-03, A-10, A-13, A-14, A-29, H-01, L-01, L-35, N-01, N-16	n/a
RO-010	C-12, E-14, F-06, F-07, J-06	n/a
RO-011	C-07, D-08, N-02, F-04, N-18	n/a
RO-012	C-03, N-14	n/a
RO-013	No SWMUs present in this area	n/a
RO-014	No SWMUs present in this area	n/a
RO-015	**A-05**, **MP-2**, B-06, B-07, B-08, B-10, C-01, C-10, D-06, D-09, F-02, G-08, G-10, H-02, H-05, I-04, L-07, L-10, L-23, L-24, L-34, L-36, L-44, MP-9	n/a
RO-016	F-03, N-17	n/a
RO-017	L-18, MP-5 ,N-23	n/a
RO-019	B-11, B-12, E-11, G-04, I-02, L-06, L-33, N-22	n/a
RO-020	B-13, **D-03, D-04, D-05, E-05**, G-05, G-06, H-03, J-02, N-21	n/a
RO-021	B-17, B-19, I-03,	n/a
RO-022	E-08	n/a
RO-023	B-09, B-16, N-13	n/a
RO-024	J-05	n/a
RO-025	A-18, A-19, A-27	n/a
RO-026	**A-08, A-09**, A-16, A-17	n/a
RO-027	A-02, L-39, L-40, **MP-2**	n/a
RO-028	A-06	n/a
RO-029	A-07, A-25	n/a
RO-030	A-26	n/a
RO-031	AOPC-2	n/a
RO-032	AOPC-3, AOPC-12, **M-07**, M-08, **M-18**	Metals
RO-033	N-06, N-09, N-11	n/a

Bold – SWMUs found to be active under RCRA
Bold – SWMUs found to be active under PMP, CERCLA, or VSWMR
Bold – Outfall sampled as a part of the evaluation

7 REFERENCES

A.T. Kearney. (1988). Phase II RCRA Facility Assessment of the U.S. Army Engineer Center and Fort Belvoir, Fort Belvoir, Virginia. Prepared for U.S. EPA Region III, Philadelphia, PA.

Amec. (2013). *Post-Operational Monitoring Report, Third Quarter 2013, Building 1124 – Fort Belvoir, Virginia*. Fort Belvoir, VA: Directorate of Public Works, Environmental and Natural Resources Division.

Amec. (2014). *Post-Operational Monitoring Report, Second Quarter 2014, Building 324 – Fort Belvoir, Virginia*. Fort Belvoir, VA: Directorate of Public Works, Environmental and Natural Resources Division.

Aptim Federal Services LLC. (2016). Final 2016 Groundwater and Landfill Gas Sampling Report CC-A11 (Poe Road Landfill) and CC-A12 (Accotink Landfill), Fort Belvoir, Virginia. Prepared for U.S. Army Corps of Engineers, Baltimore District.

Aptim Federal Services LLC. (2017). Final 2015-2016 Groundwater Sampling Data Summary for CC-A05 – Road and Grounds/ Land Management Storage Area, Fort Belvoir, Virginia. Prepared for U.S. Army Corps of Engineers, Baltimore District.

CB&I Federal Services LLC. (2013). *Corrective Measures Study Report for Compliance Cleanup Site CC-A05, Fort Belvoir, Virginia*. Prepared for U.S. Army Corps of Engineers, Baltimore District.

CB&I Federal Services LLC. (2013). *Corrective Measures Study Report for Compliance Cleanup Sites CC-A08 and CC-A09, Fort Belvoir, Virginia*. Fort Belvoir, VA: Directorate of Public Works, Environmental and Natural Resources Division.

CB&I Federal Services LLC. (2015). Final 2015 Groundwater Sampling Data Summary for CC-A08 (George Washington Village Landfill), CC-A09 (Markham School Landfill) Fort Belvoir, Virginia. Prepared for U.S. Army Corps of Engineers, Baltimore District.

CB&I Federal Services LLC. (2015). *Land Use Control Implementation Plan for CC-A05 – Road and Grounds/ Land Management Storage Area, Fort Belvoir, Virginia*. Fort Belvoir, VA: Directorate of Public Works, Environmental and Natural Resources Division.

CB&I Federal Services LLC. (2015). Land Use Control Implementation Plan for CC-A08 - George Washington Village Landfill, CC-A09 - Markham School Landfill, CC-A11 – Poe Road Landfill, CC-A12 – Accotink Landfill, Fort Belvoir, Virginia. Fort Belvoir, VA: Directorate of Public Works, Environmental and Natural Resources Division.

CH2M HILL. (1992). *Solid Waste Management Unit Study.* Fort Belvoir, VA: CH2M HILL.

Dames & Moore. (1998). Quarterly Groundwater Sampling, June 1998, Fire Training Area, Davison Army Airfield, Fort Belvoir. Fort Belvoir: Environmental and Natural Resources Division.

Dewberry and Davis. (1997). *Closure Report Aboveground Storage Tank and Oil-Water Separator at Buildings 1949/1950.* Fort Belvoir, VA: Fort Belvoir Directorate of Public Works, Environmental and Natural Resources Division.

Dewberry and Davis. (1997). *Closure Report Fire Training Area, Davison Army Airfield.* Fort Belvoir, VA: Fort Belvoir Directorate of Public Works, Environmental and Natural Resources Division.

Dewberry and Davis. (1997). *Closure Report Underground Storage Tank at Building 322.* Fort Belvoir, VA: Fort Belvoir Directorate of Public Works, Environmental and Natural Resources Division.

Dewberry and Davis. (1997). *Solid Waste Management Unit Action Plans*. Fort Belvoir, VA: Fort Belvoir Directorate of Public Works.

Dewberry. (2006). Investigation Summary Report Solid Waste Management Unit N-12 at Building 214, Fort Belvoir, Virginia. Fort Belvoir, VA: Fort Belvoir Directorate of Public Works.

EA Engineering, Science, and Technology, Inc. (2011). Final Phase II RCRA Facility Investigation Report for Solid Waste Management Unit (SWMU) A-06, Kingman Road Landfill at Main Post U.S. Army Garrison Fort Belvoir, Virginia. Fort Belvoir, VA: Fort Belvoir Directorate of Public Works.

EA Engineering, Science, and Technology, Inc. (2012). Final Phase II RCRA Facility Investigation Report for Solid Waste Management Unit (SWMU) A-07 and A-25 at Main Post U.S. Army Garrison Fort Belvoir, Virginia. Fort Belvoir, VA: Fort Belvoir Directorate of Public Works.

EA Engineering, Science, and Technology, Inc. (2012). Final Phase II RCRA Facility Investigation Report for Solid Waste Management Unit (SWMU) A-26 at Main Post U.S. Army Garrison Fort Belvoir, Virginia. Fort Belvoir, VA: Fort Belvoir Directorate of Public Works.

EA Engineering, Science, and Technology, Inc. (2012). Final Phase II RCRA Facility Investigation Report for Solid Waste Management Unit SWMU N-23 at Main Post U.S. Army Garrison Fort Belvoir, Virginia. Fort Belvoir, VA: Fort Belvoir Directorate of Public Works, Environmental and Natural Resources Division.

EA Engineering, Science, and Technology, Inc. (2013). Final Phase II RCRA Facility Investigation Report for Solid Waste Management Unit (SWMU) A-08 and SWMU A-09 at Main Post U.S. Army Garrison Fort Belvoir, Virginia. Fort Belvoir, VA: Fort Belvoir Directorate of Public Works.

EA Engineering, Science, and Technology, Inc. (2016). Final Land Use Control Implementation Plan for Sites CC-A04/A23: Former Coal Storage Area/ PCB Spill Site and CC-A24: Former DPDO Storage Area/ PCB Spill Site at Main Post U.S. Army Garrison Fort Belvoir, Virginia. Fort Sam Houston, TX: United States Army Environmental Command.

EA Engineering, Science, and Technology, Inc. (2016). Site Summary Report Addendum for Sites CC-A04/A23: Former Coal Storage Area/ PCB Spill Site and CC-A24: Former DPDO Storage Area/ PCB Spill Site at Main Post U.S. Army Garrison Fort Belvoir, Fairfax County, Virginia. Fort Sam Houston, TX: United States Army Environmental Command.

EA Engineering, Science, and Technology, Inc. (2017). Final RCRA Facility Investigation Report for Site CC-MP10: 21st Street Liquid Dump Site, Main Post United States Army Garrison, Fort Belvoir, Fairfax County, Virginia. Fort Sam Houston, TX: United States Army Environmental Command.

Environmental Chemical Corporation. (2011). Final Phase II RCRA Facility Investigation Report for Solid Waste Management Unit (SWMU) A-11 Poe Road Landfill at Main Post U.S. Army Garrison Fort Belvoir, Virginia. Fort Belvoir, VA: Fort Belvoir Directorate of Public Works, Environmental and Natural Resources Division.

Environmental Chemical Corporation. (2011). Final Phase II RCRA Facility Investigation Report for Solid Waste Management Unit (SWMU) A-12 Accotink Landfill at Main Post U.S. Army Garrison Fort Belvoir, Virginia. Fort Belvoir, VA: Fort Belvoir Directorate of Public Works, Environmental and Natural Resources Division.

Environmental Chemical Corporation. (2012). Final Phase II RCRA Facility Investigation Report for Solid Waste Management Unit (SWMU) A-05 at Main Post U.S. Army Garrison Fort Belvoir, Virginia. Fort Belvoir, VA: Fort Belvoir Directorate of Public Works, Environmental and Natural Resources Division.

Environmental Chemical Corporation. (2013). Final Phase II RCRA Facility Investigation Report Solid Waste Management Units (SWMUs) E-14 BLDG 1939 Waste POL Storage Area and F-06 BLDG 1906 Above Ground Waste POL Tank at Main Post U.S. Army Garrison, Fort Belvoir, Virginia. Fort Belvoir, VA: Fort Belvoir Directorate of Public Works, Environmental and Natural Resources Division.

MACTEC Engineering & Consulting, Inc. (2002). *Corrective Action Monitoring Report Fourth Quarter 2002, Building 1133, Fort Belvoir, Virginia.* Fort Belvoir, VA: Directorate of Installation Support, Environmental and Natural Resources Division.

Fort Belvoir Environmental Restoration Program. (2014). *Introductory language for Fort Belvoir's Environmental Restoration Program.* Fort Belvoir, VA: Directorate of Public Works, Environmental and Natural Resources Division.

Plexus Scientific Corporation. (2015). *Final RCRA Facility Investigation Report CC-MP9: Old Dump Site, Fort Belvoir, Virginia*. Fort Belvoir, VA: Directorate of Public Works, Environmental and Natural Resources Division.

Plexus Scientific Corporation. (2017). *Final RCRA Facility Investigation Report CC-MP2: 1124 PCE Detections, Fort Belvoir, Virginia*. Fort Belvoir, VA: Directorate of Public Works, Environmental and Natural Resources Division.

SCS Engineers. (2008). Phase I RCRA Facility Investigation Report for the Connector Road SWMU Site Investigation, Mulligan Road Landfill SWMU A-07, Suspected Sanitary/ Debris Landfill SWMU A-25. Fort Belvoir, VA: Directorate of Public Works, Environmental and Natural Resources Division.

SCS Engineers. (2017). *Cullum Woods Closed Sanitary Landfill Solid Waste Permit #308, Groundwater Monitoring Report – 1st Semi-Annual 2017.* Fort Belvoir, VA: Directorate of Public Works, Environmental and Natural Resources Division.

SCS Engineers. (2017). *Theote Road Construction, Demolition, and Debris Landfill 2017 Semi-Annual Groundwater Monitoring Report June.* Fort Belvoir, VA: Directorate of Public Works, Environmental and Natural Resources Division.

SES Construction and Fuel Services LLC. (2014). *Internal Decision Document for No Further Action Solid Waste Management Units (SWMUs) at US Army Garrison Fort Belvoir*. Fort Belvoir, VA: Directorate of Public Works, Environmental and Natural Resources Division.

SES Construction and Fuel Services LLC and Tetra Tech. (2015). Land Use Control Implementation Plan (LUCIP) for 20 Solid Waste Management Units (SWMUs) at US Army Garrison, Fort Belvoir, Virginia. Fort Belvoir, VA: Directorate of Public Works, Environmental and Natural Resources Division.

SES Construction and Fuel Services LLC. (2017). Final Internal Decision Document Solid Waste Management Units (SWMUs) A-14, A-29, H-01, L-01, L-35, E-01, L-12, MP-5, and MP-9 Fort Belvoir, Virginia. Fort Belvoir, VA: Directorate of Public Works, Environmental and Natural Resources Division.

Shaw Environmental, Inc. (2013). Land Use Control Implementation Plan for SWMU A-25 – Suspected Sanitary/Debris Landfill A, SWMU A-07 – Mulligan Road Landfill, SWMU A-06 –Kingman Road Landfill, SWMU A-26 – Suspected Sanitary Landfill B, SWMU N-23 –Post Dump at Fort Belvoir. Fort Belvoir, VA: Directorate of Public Works, Environmental and Natural Resources Division.

Shaw Environmental, Inc. (2013). *Remedial Investigation/Feasibility Study Report for the Infiltration Course and Tracy Road Range*. Fort Belvoir, VA: Fort Belvoir Military Munitions Response Program.

SpecPro Environmental Services LLC. (2014). *Letter Report for Sites A06 and A26 Landfill Debris Collection, US Army Garrison Fort Belvoir, Fort Belvoir, Virginia*. Fort Belvoir, VA: Directorate of Public Works, Environmental and Natural Resources Division.

Tetra Tech and SpecPro Environmental Services LLC. (2013). *Final RCRA Facility Investigation Report Solid Waste Management Unit (SWMU) E-12 at Fort Belvoir*. Fort Belvoir, VA: Directorate of Public Works.

Tetra Tech and SpecPro Environmental Services LLC. (2014). *Final Site Summary Report Solid Waste Management Unit (SWMU) A-23 at Fort Belvoir*. Fort Belvoir, VA: Directorate of Public Works.

Tetra Tech. (2008). Visual Site Inspection Report, Main Post SWMU Program, Volume I. Fort Belvoir, VA: Tetra Tech.

Tetra Tech (2009). *Administrative Closure Reports Solid Waste Management Units (Main Post) at US Army Garrison, Fort Belvoir, VA*. Fort Belvoir, VA: Directorate of Public Works, Environmental Natural Resources Division.

Tetra Tech. (2009). Draft RCRA Facility Investigation Report (RFI) Solid Waste Management Unit (SWMU) A-04 at Fort Belvoir. Fort Belvoir, VA: Directorate of Public Works.

Tetra Tech. (2009). Draft RCRA Facility Investigation Report (RFI) Solid Waste Management Unit (SWMU) A-05 at Fort Belvoir. Fort Belvoir, VA: Directorate of Public Works.

Tetra Tech. (2009). Draft RCRA Facility Investigation Report (RFI) Solid Waste Management Unit (SWMU) A-27 at Fort Belvoir. Fort Belvoir, VA: Directorate of Public Works.

Tetra Tech. (2009). Draft RCRA Facility Investigation Report (RFI) Solid Waste Management Unit (SWMU) H-02 at Fort Belvoir. Fort Belvoir, VA: Directorate of Public Works.

Tetra Tech. (2009). Draft RCRA Facility Investigation Report (RFI) Solid Waste Management Unit (SWMU) H-05 at Fort Belvoir. Fort Belvoir, VA: Directorate of Public Works.

Tetra Tech. (2009). Final RCRA Facility Investigation Report (RFI) Solid Waste Management Unit I-02 at Main Post Fort Belvoir, Virginia. Fort Belvoir, VA: Directorate of Public Works.

Tetra Tech. (2009). Draft RCRA Facility Investigation Report (RFI) Solid Waste Management Unit L-09 at Fort Belvoir. Fort Belvoir, VA: Directorate of Public Works.

Tetra Tech. (2009). Draft RCRA Facility Investigation Report (RFI) Solid Waste Management Unit (SWMU) L-33 at Fort Belvoir. Fort Belvoir, VA: Directorate of Public Works.

Tetra Tech. (2009). Draft RCRA Facility Investigation Report (RFI) Solid Waste Management Unit (SWMU) L-44 at Fort Belvoir. Fort Belvoir, VA: Directorate of Public Works.

Tetra Tech. (2009). Draft RCRA Facility Investigation Report (RFI) Solid Waste Management Unit (SWMU) N-17 at Fort Belvoir. Fort Belvoir, VA: Directorate of Public Works.

Tetra Tech. (2012). Final Administrative Closure Reports Solid Waste Management Units (Main Post) at US Army Garrison, Fort Belvoir, VA. Fort Belvoir, VA: Directorate of Public Works, Environmental Natural Resources Division.

Tetra Tech. (2012). RCRA Corrective Action, No Further Action Closure Document, Solid Waste Management Units, Main Post US Army Garrison, Fort Belvoir, VA. Fort Belvoir, VA: Directorate of Public Works, Environmental Natural Resources Division.

Tetra Tech. (2014). Final RCRA Facility Investigation Report (RFI) Solid Waste Management Unit (SWMU) A-18 at Fort Belvoir. Fort Belvoir, VA: Directorate of Public Works.

Tetra Tech. (2014). Final RCRA Facility Investigation Report (RFI) Solid Waste Management Unit (SWMU) A-19 at Fort Belvoir. Fort Belvoir, VA: Directorate of Public Works.

Tetra Tech. (2015). Land Use Control Implementation Plan (LUCIP) for 20 Solid Waste Management Units (SWMUs) at U.S. Army Garrison, Fort Belvoir, Virginia. Fort Belvoir, VA: Directorate of Public Works, Environmental Natural Resources Division.

Tidewater, Inc. (2007). Final Environmental Investigation Summary Report Area of Potential Concern-12 (AOPC-12) at Engineer Proving Ground, U.S. Army Garrison Fort Belvoir, Virginia. Fort Belvoir, VA: Fort Belvoir Directorate of Public Works, Environmental and Natural Resources Division.

Tidewater, Inc. (2007). Final Environmental Investigation Summary Report Solid Waste Management Unit (SWMU) M-08 at Engineer Proving Ground, U.S. Army Garrison Fort Belvoir, Virginia. Fort Belvoir, VA: Fort Belvoir Directorate of Public Works, Environmental and Natural Resources Division.

Tidewater, Inc. (2009). *Final Phase I RCRA Facility Investigation Main Post SWMU Site A-03, DRMO Stump Dump, U.S. Army Garrison Fort Belvoir, Virginia*. Fort Belvoir, VA: Fort Belvoir Directorate of Public Works, Environmental and Natural Resources Division.

Tidewater, Inc. (2009). Final Phase I RCRA Facility Investigation Main Post SWMU Site A-06, Kingman Road Landfill, U.S. Army Garrison Fort Belvoir, Virginia. Fort Belvoir, VA: Fort Belvoir Directorate of Public Works, Environmental and Natural Resources Division.

Tidewater, Inc. (2010). *Final Environmental Investigation Summary Report, Davison Army Airfield-1 at U.S. Army Garrison Fort Belvoir, Virginia*. Fort Belvoir, VA: Directorate of Public Works, Environmental and Natural Resources Division.

Tidewater, Inc. and MACTEC Engineering and Consulting, Inc. (2007). Final Environmental Investigation Summary Report Area of Potential Concern (AOPC)AOPC-02 Former Gasoline Tanks at

Engineer Proving Ground, U.S. Army Garrison Fort Belvoir, Virginia. Fort Belvoir, VA: Fort Belvoir Directorate of Public Works, Environmental and Natural Resources Division.

Tidewater, Inc. and MACTEC Engineering and Consulting, Inc. (2007). Final Environmental Investigation Summary Report Area of Potential Concern (AOPC)-03A and B at Engineer Proving Ground, U.S. Army Garrison Fort Belvoir, Virginia. Fort Belvoir, VA: Fort Belvoir Directorate of Public Works, Environmental and Natural Resources Division.

Tidewater, Inc. and SCS Engineers (2009). Final Phase I RCRA Facility Investigation Main Post SWMU Sites A-08 and A-16 George Washington Village Landfill and Interceptor Trench, U.S. Army Garrison Fort Belvoir, Virginia. Fort Belvoir, VA: Fort Belvoir Directorate of Public Works, Environmental and Natural Resources Division.

Tidewater, Inc. and SCS Engineers (2009). *Final Phase I RCRA Facility Investigation Main Post SWMU Site A-10, Lacey Pit, U.S. Army Garrison Fort Belvoir, Virginia*. Fort Belvoir, VA: Fort Belvoir Directorate of Public Works, Environmental and Natural Resources Division.

Tidewater, Inc. and SCS Engineers (2009). *Final Phase I RCRA Facility Investigation Main Post SWMU Sites A-13, DRMO Spoil Fill, U.S. Army Garrison Fort Belvoir, Virginia*. Fort Belvoir, VA: Fort Belvoir Directorate of Public Works, Environmental and Natural Resources Division.

Tidewater, Inc. and SCS Engineers (2009). *Final Phase I RCRA Facility Investigation Main Post SWMU Site N-23 Old Post Dump, U.S. Army Garrison Fort Belvoir, Virginia*. Fort Belvoir, VA: Fort Belvoir Directorate of Public Works, Environmental and Natural Resources Division.

Tidewater, Inc. and SCS Engineers (2010). Draft Final Phase I RCRA Facility Investigation Main Post DRMO Storage Area, SWMU Sites A-14, A-29, H-01, L-01, and L-35, U.S. Army Garrison Fort Belvoir, Virginia. Fort Belvoir, VA: Fort Belvoir Directorate of Public Works, Environmental and Natural Resources Division.

Tidewater, Inc and SES Construction and Fuel Services, LLC. (2018). *2018 Update Fort Belvoir PCB TMDL Action Plan at U.S. Army Garrison Fort Belvoir, Virginia*. Fort Belvoir, VA: Directorate of Public Works, Environmental and Natural Resources Division.

U.S. EPA. Directive 9502.00-6. (1987). *Definition of Solid Waste Management Unit for the Purpose of Corrective Action Under Section 3004(u)*. Retrieved from https://www.epa.gov/rcra/policies-and-guidance-documents-resource-conservation-and-recovery-act-rcra-state-authorization

U.S. EPA. (2007). Correspondence to Mr. Patrick McLaughlin of U.S. Army Garrison, Fort Belvoir. Dated October 4, 2007.

U.S. EPA. (2007). Correspondence to Mr. Patrick McLaughlin of U.S. Army Garrison, Fort Belvoir. Dated October 30, 2007.

U.S. EPA. (2007). Correspondence to Mr. Patrick McLaughlin of U.S. Army Garrison, Fort Belvoir. Dated December 26, 2007.

U.S. EPA. (2010). Correspondence to Mr. Patrick McLaughlin of U.S. Army Garrison, Fort Belvoir. Dated July 30, 2010.

U.S. EPA. (2011). Correspondence to Mr. Patrick McLaughlin of U.S. Army Garrison, Fort Belvoir. Dated January 3, 2011.

U.S. EPA. (2011). Correspondence to Mr. Patrick McLaughlin of U.S. Army Garrison, Fort Belvoir. Dated January 12, 2011.

U.S. EPA. (2012). Correspondence to Mr. Patrick McLaughlin of U.S. Army Garrison, Fort Belvoir. Dated January 9, 2012.

U.S. EPA. (2012). Correspondence to Mr. Patrick McLaughlin of U.S. Army Garrison, Fort Belvoir. Dated May 24, 2012.

U.S. EPA. (2012). Correspondence to Mr. Patrick McLaughlin of U.S. Army Garrison, Fort Belvoir. Dated July 6, 2012.

U.S. EPA. (2012). Correspondence to Mr. Patrick McLaughlin of U.S. Army Garrison, Fort Belvoir. Dated September 21, 2012.

U.S. EPA. (2012). Correspondence to Mr. Patrick McLaughlin of U.S. Army Garrison, Fort Belvoir. Dated December 7, 2012.

U.S. EPA. (2013). Correspondence to Mr. Patrick McLaughlin of U.S. Army Garrison, Fort Belvoir. Dated January 23, 2013.

U.S. EPA. (2013). Correspondence to Mr. Patrick McLaughlin of U.S. Army Garrison, Fort Belvoir. Dated December 11, 2013.

U.S. EPA. (2013). Correspondence to Mr. Patrick McLaughlin of U.S. Army Garrison, Fort Belvoir. Dated December 17, 2013.

U.S. EPA. (2014). Correspondence to Mr. Patrick McLaughlin of U.S. Army Garrison, Fort Belvoir. Dated March 17, 2014.

U.S. EPA. (2015). Correspondence to Mr. Felix Mariani, Chief of Environmental and Natural Resources Division, Fort Belvoir. Dated August 6, 2015.

U.S. EPA. (2016). Correspondence to Mr. Felix Mariani, Chief of Environmental and Natural Resources Division, Fort Belvoir. Dated February 4, 2016.

U.S. EPA. (2016). Correspondence to Mr. Felix Mariani, Chief of Environmental and Natural Resources Division, Fort Belvoir. Dated April 4, 2016.

U.S. EPA. (2018). Resource Conservation and Recovery Act (RCRA) Laws and Regulations. https://www.epa.gov/rcra

VADEQ. (2015). Virginia Hazardous Waste Management Permit for Storage and Corrective Action, U.S. Army Garrison Fort Belvoir, EPA ID No. 7213720082, Module IV Site-Wide Corrective Action. Virginia: VADEQ.

VADEQ. (2003). Correspondence to Lt. Colonel Kevin W. Tate, Directorate of Installation Support, Fort Belvoir. Dated April 29, 2003.

VADEQ. (2014). Statement of Basis Fort Belvoir US Army Garrison, Fort Belvoir, VA. Virginia: VADEQ.

VADEQ. (2016). Correspondence to Felix Mariani, Chief of Environmental and Natural Resources Division, Fort Belvoir. Dated August 5, 2016.

VADEQ. (2017). Correspondence to Bill Sanders, Director of Public Works and Logistics, Fort Belvoir. Dated April 28, 2017.

VADEQ. (2018). Correspondence to Felix Mariani, Chief of Environmental and Natural Resources Division, Fort Belvoir. Dated March 9, 2018.