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NAS KEY WEST
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CERCLA FIVE-YEAR REVIEW OF INSTALLATION SITES 1, 3, 7, 8, 21 AND AREA OF CONCERN (AOC) B, AND RCRA PART B PERMIT CORRECTIVE ACTION EFFECTIVENESS EVALUATION OF SOLID WASTE MANAGEMENT UNITS (SWMU) 1, 2, 3, 5, 7 AND 9 NAS KEY WEST FL

4/25/2016

BATTELE

FINAL

CERCLA FIVE-YEAR REVIEW OF SITES IR 1, IR 3, IR 7, IR 8, IR 21, AND AOC B, AND RCRA PART B PERMIT CORRECTIVE ACTION EFFECTIVENESS EVALUATION OF SITES SWMU 1, SWMU 2, SWMU 3, SWMU 5, SWMU 7, AND SWMU 9

NAVAL AIR STATION KEY WEST

KEY WEST, FLORIDA

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April 25, 2016

EXECUTIVE SUMMARY

Battelle Memorial Institute (Battelle) and Enviro Compliance Solutions, Inc. (ECS) have prepared this Five-Year Review/Corrective Action Effectiveness Evaluation for 12 sites at Naval Air Station (NAS) Key West, Florida on behalf of the Department of the Navy, Naval Facilities Engineering Command (NAVFAC) Southeast. This report has been prepared under Contract Number N62583-11-D-0515, Contract Task Order (CTO) Number 0017.

NAS Key West is located in southern Monroe County, Florida. Key West, the westernmost major island of the Florida Keys, lies approximately 150 miles southwest of Miami. Key West is connected to the mainland by the Overseas Highway (U.S. Highway No. 1). Several installations in various parts of the lower Florida Keys comprise what is known as the Naval Complex at Key West. Most of these are on Key West and Boca Chica Key (Figures 1-1 and 1-2). Other parts of the complex include Sigsbee Key (formerly Dredgers Key), Fleming Key, Demolition Key, and Big Coppitt Key. The entire complex encompasses approximately 5,675 acres. At present, NAS Key West maintains aviation operations, a research laboratory, communications intelligence, counter-narcotics air surveillance operations, a weather service, and several other activities. In addition to the Naval activities and units, other Department of Defense (DoD) and Federal agencies at NAS Key West include the U.S. Coast Guard, U.S. Army Special Forces Underwater Training School, and the Joint Interagency Task Force South (JIATF South).

Purpose

The primary purpose of the five-year review/corrective action effectiveness evaluation is to determine whether the remedial actions are being implemented as specified in the Statements of Basis (SOBs) or Decision Documents (DDs), and whether these actions remain protective of human health and the environment.

Included Sites

Six of the NAS Key West sites (Area of Concern [AOC] B, Installation Restoration [IR] Site 1 [IR 1], IR 3, IR 7, IR 8 and IR 21) are regulated under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). Five-year reviews are required by CERCLA and the National Oil and Hazardous Substances Pollution Contingency Plan when hazardous substances, pollutants, and contaminants remain in the environment and do not allow for unrestricted use of the site and unlimited exposure.

The remaining six NAS Key West sites (Solid Waste Management Unit [SWMU] 1, SWMU 2, SWMU 3, SWMU 5, SWMU 7, and SWMU 9) are regulated under the Resource Conservation and Recovery Act (RCRA). Five-year reviews are not a requirement under RCRA, but the NAS Key West Partnering Team decided to perform corrective action effectiveness evaluations to meet requirements of the SOBs and to demonstrate the Station's commitment to environmental stewardship. For efficiency, the corrective action effectiveness evaluations for SWMUs 1, 2, 3, 5, 7, and 9 are combined with the five-year reviews for the CERCLA sites in this document and follow the format of a CERCLA five-year review.

Of the 12 sites, four are no longer actively monitored. These consist of: AOC B, IR 3, IR 21, and SWMU 3. Seven of the sites are included in the Annual Performance Monitoring (APM) program for NAS Key West. These consist of: IR 1, IR 7, 1R 8, SWMU 1, SWMU 2, SWMU 5, and SWMU 7. One site, SWMU 9, is actively monitored but is not in the APM program.

Background

Several investigations have been performed at NAS Key West since the mid-1980s to confirm or characterize contamination. As part of the Naval Assessment and Control Installation Pollutants Program (NACIP), an initial assessment study (IAS) was performed by Envirodyne Engineers, Inc. in 1985. The verification phase of the NACIP confirmation study was performed by Geraghty and Miller (G&M) in 1986. This study verified the presence or absence of shallow groundwater and soil contamination at various sites, and recommended sites that need further site specific investigations during the characterization phase of the confirmation study.

In April 1988, a visual site inspection (VSI) was conducted by the United States Environmental Protection Agency (EPA) as part of the RCRA Facility Assessment (RFA) process. A preliminary remedial investigation (RI) report was prepared by IT Corporation, Inc. (IT) and was followed by a full RCRA Facility Investigation (RFI)/RI. B&RE subsequently performed the Supplemental RFI/RI for high priority sites and the Supplemental RFI/RI for eight sites, which recommended remedies for 12 sites at NAS Key West. Corrective measures studies (CMS) were performed for several of the SWMUs, evaluating and ultimately selecting remedies for several of the sites.

Remedies are documented in SOBs for RCRA sites and DDs for CERCLA sites. The remedies for all of the sites in this five-year review with the exception of SWMU 9 include land use controls (LUCs), and the remedies for several of the sites also include long-term monitoring of environmental media.

This is the third five-year review/corrective action effectiveness evaluation for NAS Key West. The first and second five-year reviews were conducted by Tetra Tech NUS, Inc. (TtNUS) in 2004 and 2009, respectively. The first five-year review was triggered by the DD and Responsiveness Summary for IR 3, IR 7, and AOC B in 1999.

Five-Year Review Process

In accordance with Department of the Navy (DoN) policy and EPA guidance (EPA Office of Solid Waste and Emergency Response [OSWER] Directive 9355.7-03B-P [EPA, 2001]), the five-year review process at the 12 sites addressed in this report consisted of the following components:

Community notification and involvement: Following completion of the five-year review, the Five-Year Review Report including community input will be made available to the stakeholders.

Document review: Numerous documents were reviewed for the 12 sites as part of this five-year review. The objective of the document review was to obtain relevant information that could be used as the basis for evaluating the performance of the remedies implemented at these sites. The types of documents reviewed included the previous Five-Year Review Report, site APM reports, specific site investigation reports, annual inspection reports, and various regulatory guidance documents and Florida cleanup regulations and standards.

Data review: The data reviewed for the 12 sites included inspection checklists to evaluate compliance with LUCs, and all relevant groundwater, surface water and sediment monitoring data.

Site Inspections: Site inspections were conducted for the 12 sites as part of this five-year review to provide information on the status of these sites, and to visually confirm and document the conditions of the remedies, the sites, and the surrounding areas.

Interviews: Interviews were conducted with various stakeholders as part of this five-year review to provide additional information about the status of the 12 sites. The interviewees included representatives from NAVFAC Southeast and NAS Key West.

Protectiveness Determinations: Technical assessments of the remedies at the 12 sites were conducted, and protectiveness statements were formulated for each site based on the data and document reviews, site inspections, interviews and technical assessment results.

Summary of Findings

Overall, the remedies for all 12 sites are protective of human health. LUCs prevent human exposure to site contaminants at 11 of the sites, and there are no complete pathways for human exposure at SWMU 9. The remedies are also protective of the environment with some sites exhibiting elevated ecological risk to benthic invertebrates within localized areas. This localized risk was judged acceptable in the DD or SOB at applicable sites.

This five-year review did not identify any issues that could impact the remedy at any of the 12 sites. Table ES-1 provides a site-by-site listing of issues in accordance with CERCLA five-year review guidance (EPA, 2001). Table ES-2 summarizes recommendations and follow-up actions for each site.

The following findings and recommendations are generic to the seven APM sites:

- Florida CTLs enumerated in FAC Chapter 62-777 have been updated since the current action levels for chemicals of concern (COCs) were adopted. The NAS Key West Partnering Team should update project action levels to conform to current CTLs.

Timelines for implementing recommendations and follow-up actions will be developed by the NAS Key West Partnering Team. Based on DoD policy (Update to DoD 4715.20, June 02, 2014) the next five-year review is required to be completed and signed five years from the signature date of this report.

TABLE ES-1. Summary of Issues

Site	Issues	Affects Protectiveness (Y/N)	
		Current	Future
AOC B	No issues were found that affect the remedy protectiveness	N	N
IR 1	No issues were found that affect the remedy protectiveness	N	N
IR 3	No issues were found that affect the remedy protectiveness	N	N
IR 7	No issues were found that affect the remedy protectiveness	N	N
IR 8	No issues were found that affect the remedy protectiveness	N	N
IR 21	No issues were found that affect the remedy protectiveness	N	N
SWMU 1	No issues were found that affect the remedy protectiveness	N	N
SWMU 2	No issues were found that affect the remedy protectiveness	N	N
SWMU 3	No issues were found that affect the remedy protectiveness	N	N
SWMU 5	No issues were found that affect the remedy protectiveness	N	N
SWMU 7	No issues were found that affect the remedy protectiveness	N	N
SWMU 9	No issues were found that affect the remedy protectiveness	N	N

TABLE ES-2. Summary of Recommendations and Follow-up Actions

Site	Recommendations/Follow-up Actions	Affects Protectiveness (Y/N)	
		Current	Future
AOC B	• LUCs should remain in place at the site.	Y	Y
IR 1	• LUCs should remain in place at the site. • Groundwater and sediment sampling should be reduced to a quinquennial frequency to support future five year reviews because there are no groundwater COCs and groundwater exposure pathways for ecological receptors are being addressed by sediment monitoring. • The NAS Key West Partnering Team should develop timelines for implementing these recommendations.	Y	Y
IR 3	• The selected remedy (asphalt cap and LUCs) should be maintained.	Y	Y
IR 7	• LUCs should remain in place at the site. • Groundwater sampling should be reduced to a quinquennial frequency to support future five year reviews because groundwater pathways to human receptors are rendered incomplete by LUCs. • The NAS Key West Partnering Team should develop timelines for implementing these recommendations.	Y	Y
IR 8	• LUCs should remain in place at the site. • Groundwater sampling should be reduced to a quinquennial frequency to support future five year reviews because groundwater pathways to human receptors are rendered incomplete by LUCs. • The NAS Key West Partnering Team should develop timelines for implementing these recommendations.	Y	Y
IR 21	• LUCs should remain in place at the site.	Y	Y
SWMU 1	• LUCs should remain in place at the site. • Surface water, groundwater and sediment sampling should be reduced to a quinquennial frequency to support future five year reviews because the SOB did not identify any surface water or sediment ECCs.	Y	Y

TABLE ES-2. Summary of Recommendations and Follow-up Actions (Continued)

Site	Recommendations/Follow-up Actions	Affects Protectiveness (Y/N)	
		Current	Future
	• The partnering team should develop an investigation to further evaluate the arsenic exceedance in groundwater near monitoring well S1MW-07. • The NAS Key West Partnering Team should develop timelines for implementing these recommendations.		
SWMU 2	• LUCs should remain in place at the site. • Groundwater, surface water, and sediment monitoring should be reduced to a quinquennial frequency to support future five year reviews. • The NAS Key West partnering Team should develop timelines for implementing these recommendations.	Y	Y
SWMU 3	• LUCs should remain in place at the site.	Y	Y
SWMU 5	• LUCs should remain in place at the site. • Surface water and sediment sampling should be reduced to a quinquennial frequency to support future five year reviews because there are no surface water COCs or ECCs, and because sediment COCs are not detected and there are no sediment ECCs. • The NAS Key West Partnering Team should develop timelines for implementing these recommendations.	Y	Y
SWMU 7	• LUCs should remain in place at the site. • Surface water and sediment sampling should be reduced to a quinquennial frequency to support future five year reviews because there are no surface water or sediment ECCs. • The NAS Key West Partnering Team should develop timelines for implementing these recommendations.	Y	Y
SWMU 9	• Pursue a NFA determination for SWMU 9 under Chapter 62-780.680 (2)(c)4. FAC. • The NAS Key West Partnering Team should develop a timeline for implementing the above recommendation.	N	N

SIGNATURE PAGE

Signature sheet certifying the third five-year review report for Naval Air Station Key West.

_____

S.P. McAlearney, CAPT USN
Commanding Officer
Naval Air Station Key West

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TABLES

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APPENDICES

LIST OF ACRONYMS AND ABBREVIATIONS

ABB	ABB Environmental Services, Inc.
AIMD	Aircraft Intermediate Maintenance Department
AOC	Area of Concern
APHIS	Animal and Plant Health Inspection Services
APM	Annual Performance Monitoring
ARAR	Applicable or Relevant & Appropriate Requirements
AST	aboveground storage tank
Battelle	Battelle Memorial Institute
BBL	Blasland, Bouck & Lee, Inc.
BEI	Bechtel Environmental, Inc.
BRAC	Base Realignment and Closure
bls	below land surface
B&RE	Brown and Root Environmental, Inc.
BTEX	benzene, toluene, ethylbenzene, and xylenes
CAMP	Corrective Action Management Plan
CCI	CH2MHill Constructors, Inc.
cDCE	cis-1,2-dichloroethene
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CMS	Corrective Measures Study
COC	chemical of concern
CTL	Cleanup Target Level
CTO	Contract Task Order
DCE	dichloroethene
DD	decision document
DDD	4,4'-dichlorodiphenyl dichloroethane
DDE	4,4'-dichlorodiphenyl dichloroethylene
DDT	4,4'-dichlorodiphenyl trichloroethane
DO	dissolved oxygen
DoD	Department of Defense
DON	Department of the Navy
EBTS	enhanced biodegradation treatability study
ECC	ecological chemical of concern
ECS	Enviro Compliance Solutions, Inc.
EPA	U.S. Environmental Protection Agency
ERA	ecological risk assessment
ER-M	effects range-median
FAA	Federal Aviation Administration
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FS	Feasibility Study
FWS	U.S. Fish and Wildlife Service

GCTL	Groundwater Cleanup Target Level
G&M	Geraghty and Miller
HHRA	human health risk assessment
HRC®	Hydrogen Release Compound®
HSWA	Hazardous and Solid Waste Amendments
IAS	Initial Assessment Study
IC	institutional control
IR	Installation Restoration
IRA	Interim Remedial Action
IT	IT Corporation, Inc.
JIATF	South Joint Interagency Task Force South.
LNAPL	light non-aqueous phase liquid
LUC	Land-Use Control
LUCIP	Land-Use Control Implementation Plan
µg/L	micrograms per liter
MCL	maximum contaminant level
NACIP	Naval Assessment and Control Installation Pollutants Program
NAS	Naval Air Station
NAVFAC	Naval Facilities Engineering Command
NFA	no further action
NPDES	National Pollutant Discharge Elimination System
NSA	National Security Agency
OES	Omega Environmental Services
OHC	OHC Environmental Engineering
ORC®	Oxygen Release Compound®
ORP	oxidation/reduction potential
OSWER	EPA Office of Solid Waste and Emergency Response
PAH	polynuclear aromatic hydrocarbon
PCB	polychlorinated biphenyl
PEL	Probable Effects Level
PMP	Performance Monitoring Plan
RAC	Remedial Action Contract
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
REA	REA Remedial Solutions, Inc.
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RI	Remedial Investigation
SAL	Screening Action Level
SOB	statement of basis
SQAG	Sediment Quality Assessment Guideline

SSI	Supplemental Site Inspection
SVOC	semi-volatile organic compound
SWMU	Solid Waste Management Unit
TAL	Target Analyte List
TCE	trichloroethene
tDCE	trans-1,2-dichloroethene
TRPH	total recoverable petroleum hydrocarbons
TtNUS	Tetra Tech NUS, Inc.
USACE	U.S. Army Corps of Engineers
UFP SAP	Uniform Federal Policy Sampling and Analysis Plan
USDA	U.S. Department of Agriculture
UST	underground storage tank
VOC	volatile organic compound
VSI	Visual Site Inspection

1.0 INTRODUCTION

Battelle and Enviro Compliance Solutions, Inc. (ECS) have prepared this Five-Year Review/Corrective Action Effectiveness Evaluation for 12 sites at Naval Air Station (NAS) Key West, Florida, on behalf of the Department of the Navy (DON), Naval Facilities Engineering Command (NAVFAC) Southeast. This report has been prepared under Contract Number N62583-11-D-0515, Contract Task Order (CTO) Number 0017.

The purpose of the five-year review/corrective action effectiveness evaluation is to determine whether the remedies at the 12 sites remain protective of human health and the environment. The methods, findings, and conclusions of the review are documented in this report. In addition, this report identifies issues found during the review, if any, and presents recommendations to address them.

This is the third five-year review for NAS Key West. The first and second five-year reviews were conducted by Tetra Tech NUS, Inc. (TtNUS, 2004a, 2010a). The first five-year review was triggered by the Decision Document (DD) and Responsiveness Summary for Installation Restoration (IR) Sites 3 and 7, and Area of Concern (AOC) B in 1999 (TtNUS, 1999a).

Section 2 of this report contains the five-year reviews for Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) sites, which consist of AOC B, IR 1, IR 3, IR 7, IR 8, and IR 21. Section 3 contains the corrective action effectiveness evaluations for Resource Conservation and Recovery Act (RCRA) sites, which consist of Solid Waste Management Unit (SWMU) 1, SWMU 2, SWMU 3, SWMU 5, SWMU 7, and SWMU 9. Following the protocol established in the previous five-year review, the corrective action effectiveness evaluations for SWMUs 1, 2, 3, 5, 7, and 9 are combined with the five-year reviews for the CERCLA sites in this document and follow the format of a CERCLA five-year review. Separate subsections for each of the 12 sites present each site's history, background, remedial actions, five-year review findings, technical assessment, recommendations, and protectiveness statements.

Section 4.0 provides a general summary, conclusions, and protectiveness statement for the NAS Key West sites. The most recent monitoring data available for this review were the 2013 annual performance monitoring (APM) data contained in the Final 2013 APM report (Battelle, 2015) for IR 1, 7, and 8, and SWMUs 1, 2, 5 and 7. Monitoring data from 2013 contained in the 2013 groundwater monitoring report (Battelle, 2014) were reviewed for SWMU 9. Data tables containing recent and selected historical data are presented in Appendix A. Selected site data are included on figures for reference.

Appendix B provides a comparison of project action levels with current Florida cleanup target levels (CTLs) published in Florida Administrative Code (FAC) Chapter 62-777 and cross-referenced chapters. Project action levels have been selected by the NAS Key West Partnering Team from several sources.

Appendix C provides forms containing information from the site inspections and interviews conducted for this five-year review.

Appendix D contains comments received from the Florida Department of Environmental Protection (FDEP) on the draft Five-Year Review and the responses that were incorporated into this version of the document.

1.1 OVERVIEW OF NAS KEY WEST

NAS Key West is located in southern Monroe County, Florida. Key West, the westernmost major island of the Florida Keys, lies approximately 150 miles southwest of Miami. Key West is connected to the mainland by the Overseas Highway (U.S. Highway No. 1). Several installations in various parts of the lower Florida Keys comprise what is known as the Naval Complex at Key West. Most of these are on Key West and Boca Chica Key (Figures 1-1 and 1-2). Other parts of the complex include Sigsbee Key (formerly Dredgers Key), Fleming Key, Demolition Key, and Big Coppitt Key. The entire complex encompasses approximately 5,675 acres (Brown & Root Environmental [B&RE], 1997). At present, NAS Key West maintains aviation operations, a research laboratory, communications intelligence, counter-narcotics air surveillance operations, a weather service, and several other activities. In addition to the Naval activities and units, other Department of Defense (DoD) and Federal agencies at NAS Key West include the U.S. Coast Guard, U.S. Army Special Forces Underwater Training School, and the Joint Interagency Task Force South (JIATF South).

Several investigations have been performed at NAS Key West since the mid-1980s to confirm or characterize contamination. As part of the Naval Assessment and Control Installation Pollutants Program (NACIP), an initial assessment study (IAS) was performed by Envirodyne Engineers, Inc. in 1985 (Envirodyne, 1985). The verification phase of the NACIP confirmation study was performed by Geraghty and Miller (G&M) in 1986 (G&M, 1987). This study verified the presence or absence of shallow groundwater and soil contamination at various sites, and recommended sites that need further site-specific investigations during the characterization phase of the confirmation study.

In April 1988, a visual site inspection (VSI) was conducted by the U.S. Environmental Protection Agency (EPA) as part of the RCRA Facility Assessment (RFA) process (EPA, 1988). A preliminary remedial investigation (RI) report was prepared by IT Corporation, Inc. (IT, 1991) and was followed by a full RCRA Facility Investigation (RFI)/RI (IT, 1994). B&RE subsequently performed a Supplemental RFI/RI for high priority sites (B&RE, 1997) including SWMUs 1, 2, 3 and 9 and a Supplemental RFI/RI for eight sites (B&RE, 1998a) including SWMUs 4, 5 and 7, IRs 1, 3, 7 and 8, and AOC B. The supplemental RFI/RIs collectively recommended remedies for 12 sites at NAS Key West. Corrective measures studies (CMS) were performed for several of the SWMUs, evaluating and ultimately selecting remedies for several of the sites.

Remedies are documented in Statements of Basis (SOBs) for RCRA sites (i.e., SWMUs) or DDs for CERCLA sites (i.e., IR Sites). The remedies for all sites include land use controls (LUCs), and the remedies for several of the sites also include long-term monitoring.

On October 24, 2005, Hurricane Wilma passed about 70 miles north of Key West. The NAS Key West Partnering Team visited numerous RCRA and CERCLA sites at NAS Key West in January 2006 and determined that the storm surge from Hurricane Wilma might have redistributed

contaminants outside existing site boundaries and/or compromised the integrity of site monitoring wells at SWMUs 1, 2, 4, and 5.

Although other sites were impacted by the storm surge, the Partnering Team concluded that the potential for contaminant redistribution or monitoring well impacts was low at other sites (TtNUS, 2006). Therefore, the subsequent Storm Surge Investigation, which was conducted in November 2006, was limited to SWMUs 1, 2, 4, and 5. The Storm Surge Investigation Report recommended expansion of the site boundary for SWMUs 1 and 2 and replacement of multiple monitoring wells that had been compromised by the hurricane storm surge (TtNUS, 2007).

1.2 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND SITE-SPECIFIC ACTION LEVELS

The primary purpose of the five-year review/corrective action effectiveness evaluation is to determine whether the remedial actions are being implemented as specified in the SOBs or DDs, and whether these actions remain protective of human health and the environment.
A key part of the protectiveness determination involves evaluation of changes or additions to applicable or relevant and appropriate requirements (ARARs) that might call into question the protectiveness of the remedies at the sites. ARARs are enforceable requirements that pertain to specific chemicals of concern (COCs) and risk pathways that form the basis for the selected remedies documented in the DDs and SOBs.

The State of Florida has promulgated CTLs for groundwater, surface water, and soil (FAC Chapter 62-777 Tables I and II). CTLs for site COCs and media judged to pose unacceptable risk are ARARs. CTLs are updated on an ongoing basis. CTLs have been historically used as screening values for NAS Key West IR Program sites; however, only CTLs for site COCs are considered ARARs.

Chapter 62-777 also cross references other FAC chapters that address groundwater, surface water, and sediment quality. These other chapters are also updated from time to time.

In addition to the CTLs contained in Chapter 62-777, contaminated site cleanup criteria contained in FAC Chapter 62-780 have been used as screening criteria.

For sediment quality criteria, Sediment Quality Assessment Guidelines (SQAGs), referenced in FAC Chapter 62-777, are used as the primary screening criteria (MacDonald Environmental Sciences Ltd., 1994). The SQAGs have not been formally revised since their original publication in 1994, but toxicity values for individual contaminants on which the SQAGs were originally based have been revised for selected chemicals; therefore, the SQAGs do not reflect the most current toxicity information for all potential contaminants.

Background concentrations of inorganics and pesticides have historically been taken into consideration by comparing twice the background concentration for the NAS Key West background dataset to the proposed action level. When twice the background concentration is greater than the proposed action level, twice the background has been generally used as the screening value.

Specific action level information for COCs is provided in site-specific subsections of this report and in accompanying figures and tables. Appendix B presents tables that compare current project action levels taken from the 2013 APM report (Battelle, 2015) and the 2013 SWMU 9 groundwater monitoring report (Battelle, 2014) with current (2014) CTLs for groundwater and surface water. It is important to note that the selected remedies involve risk management decisions that have been concurred upon by the NAS Key West Partnering Team. Thus, exceedance of screening criteria does not necessarily call into question the protectiveness of a remedy, particularly if the constituent (and associated environmental medium) is not a COC for risk purposes.

Figure 1-1. NAS Key West Location Map

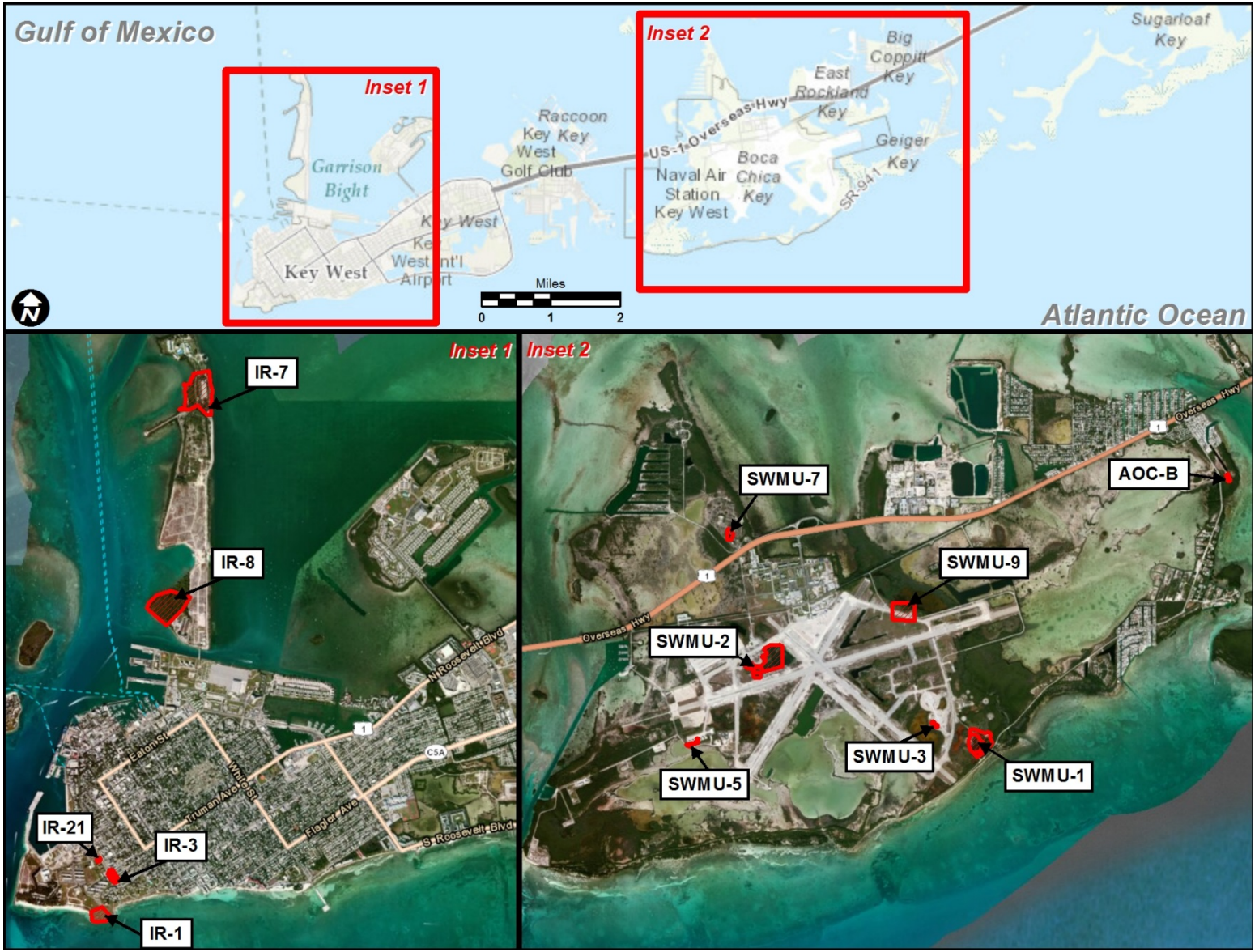


Figure 1-2. Site Location Map

2.0 CERCLA SITES

Six of the NAS Key West sites requiring five-year reviews (AOC B, IR 1, IR 3, IR 7, IR 8 and IR 21) are regulated under CERCLA. Five-year reviews are required by CERCLA and the National Oil and Hazardous Substances Pollution Contingency Plan when hazardous substances, pollutants, and contaminants remain in the environment and do not allow for unlimited use of the site and unrestricted exposure to site media.

This is the third five-year review for NAS Key West IR sites. The first five-year review was prepared in 2004 (TtNUS, 2004a), and was triggered by the DD and Responsiveness Summary for IR 3, IR 7, and AOC B in 1999 (TtNUS, 1999a). The DDs for IR 1, IR 8, and IR 21 were issued in September 2000 (TtNUS, 2000b and 2000e). The second five-year review was conducted in 2009 (TtNUS, 2010a). Sections 2.1 through 2.6 present the third five-year review for CERCLA sites AOC B, IR 1, IR 3, IR 7, IR 8, and IR 21, respectively.

2.1 AOC B - BIG COPPITT KEY ABANDONED CIVILIAN DISPOSAL AREA

This section describes the CERCLA five-year review for AOC B, the Big Coppitt Key Abandoned Civilian Disposal Area.

2.1.1 History and Site Chronology

A list of important AOC B historical events and relevant dates in the site chronology is shown below.

Date	Event or Activity
1985	Navy purchased property
May 1985	IAS Report produce by Envirodyne Engineers, Inc.
June 1994	RFI/RI Report issued by IT
November 1995	Delineation Sampling Report issued by Bechtel Environmental, Inc. (BEI)
April 1996	Interim Remedial Action (IRA) excavation completed by BEI
January 1998	Supplemental RFI/RI Report for eight sites issued by B&RE
October 1998	Proposed Plan
April 1999	DD for IR 3, IR 7, and AOC B
December 2004	First five-year review conducted by TtNUS
July 2010	Second five-year review conducted by TtNUS

2.1.2 Background

2.1.2.1 Site Description

The Big Coppitt Key Abandoned Civilian Disposal Area is located east of the NAS Key West airfield on Big Coppitt Key (Figure 2-1). The Navy purchased the property in 1985 to comply with Federal Aviation Administration (FAA) requirements for an Aircraft Compatibility Usage Installation Zone. The site encompasses approximately 10 acres, of which approximately 1.6 acres are occupied by a dead end canal. At the southeastern end of the site is the former disposal area used by civilians for discarded automobile body and frame parts. A mangrove wetland extends to the east, west, and south of the former disposal area. The canal and a large cleared

area are located north of the former disposal area. The ground elevations at the site vary from sea level to approximately 2 feet above sea level. All runoff from precipitation appears to drain directly into the canal and into the mangrove wetlands (B&RE, 1998a).

2.1.2.2 Summary of Sampling Results

An RFI/RI was performed in 1993 by IT Corporation. Groundwater, surface water, sediment, and soil at AOC B were investigated. Analytical results indicated metal concentrations above background in all media, and polychlorinated biphenyls (PCBs) were detected in surface water. The RFI/RI Report recommended an IRA to remove waste from the site or prevent further contact between the waste and surface water and sediment. The RFI/RI Report also recommended installing groundwater monitoring wells to delineate the extent of groundwater contamination, a potable water well survey, an ecological receptor survey, a baseline human health risk assessment (HHRA), and additional sediment sampling (IT, 1994).

2.1.2.3 1996 Interim Remedial Action

In 1996, BEI performed an IRA, removing 1,251 cubic yards of soil. Trash and debris were also removed from the site. Confirmation samples were collected from the excavated area to verify the removal of the impacted soil. The area was backfilled with organic substrate until the ground surface contours matched the existing wetland elevations (BEI, 1998). Following the IRA, a Supplemental RFI/RI was performed that recommended no further action (NFA) for AOC B (B&RE, 1998a).

2.1.2.4 Summary of Risk

The Supplemental RFI/RI included a baseline HHRA and an ecological risk assessment (ERA). Metals and pesticides were the most frequently detected contaminants at AOC B. PCBs were detected in isolated surface water and sediment samples. Volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) were rarely detected in any medium. The baseline HHRA concluded that contaminants were present at high enough levels to cause possible adverse non-carcinogenic health effects to future residential receptors. The ERA concluded that contaminants may pose potential risks to benthic organisms. However, it was determined that remediation of sediments at AOC B would not improve the quality of the benthic habitat and could re-suspend contaminants in water, potentially increasing their bioavailability. The Supplemental RFI/RI Report for eight sites recommended that a NFA DD be prepared for AOC B, with the provision that a future residential scenario be prevented by institutional controls (ICs) (B&RE, 1998a).

Based on the HHRA and ERA, site COCs and ecological chemicals of concern (ECCs), and their respective media at AOC B are summarized as follows:

Exposure Medium	COC for Human Health Risk	ECC for Ecological Risk
Soil	none	none
Groundwater	none	none
Surface Water	antimony	none
Sediment	arsenic iron	none

2.1.3 Remedial Actions

2.1.3.1 Remedy Selection

The Supplemental RFI/RI recommended NFA for AOC B, but indicated that AOC B was not appropriate for unlimited use and unrestricted exposure (B&RE 1998a). ICs consisting of LUCs was selected as the remedy at the site. The selected remedy is summarized in the Proposed Plan for AOC B (TtNUS, 1998a) and documented in the DD for IR 3, IR 7, and AOC B (TtNUS, 1999a).

The remedial action objective (RAO) for AOC B is not explicitly stated in the DD, but can be reasonably inferred from the results of the baseline HHRA, ERA, and from the discussion of the selected remedy in the DD, as follows:

- Prevent contact between human receptors and site COCs.

2.1.3.2 Remedy Implementation

LUCs were developed through Land-Use Control Implementation Plans (LUCIPs). These controls were designed to ensure protection of human health and the environment by restricting future site use and accessibility, educating NAS Key West personnel, and maintaining records of contamination. The LUCs documented in the NAS Key West Base Master Plan prevent future residential use at this site. In addition, access to AOC B is restricted, since the site is on an active military base with no planned change in site usage for the foreseeable future. Furthermore, personnel from the NAS Key West Public Works Department are required to visually inspect AOC B on a quarterly basis to ensure that all LUCs are being implemented and properly maintained. The NAS Key West Public Works Department submits an annual report to the FDEP describing the results of the quarterly inspections.

2.1.4 Five-Year Review Process

2.1.4.1 Document Review

Because the selected remedy is LUCs, no sampling has been performed at AOC B in the past five years and no documents have been issued. Therefore, a document review for AOC B is not applicable.

2.1.4.2 Data Review and Evaluation

Because the selected remedy is LUCs, no analytical data have been generated since the last five-year review.

2.1.4.3 Site Inspection and Interviews

LUCs are inspected quarterly, and an annual report is prepared and submitted to FDEP. Selected annual LUC compliance reports were reviewed for this five-year review. In addition, a specific site inspection, including interviews, was conducted for the five-year review. Information was recorded on site inspection/interview forms that are presented in Appendix C. No significant issues have been identified. Since access to the site is restricted, trespassing is minimal.

2.1.5 Technical Assessment

The Comprehensive Five-Year Review Guidance (EPA, 2001) states that the technical assessment section should answer three primary questions, each of which is presented below.

2.1.5.1 Question A

Is the remedy functioning as intended by the decision documents?

The remedy is functioning as intended. Access to AOC B is restricted. NAS Key West personnel perform quarterly visual inspections to ensure adherence to LUCs and an annual report is submitted to FDEP describing the results of the quarterly inspections. There is no planned change in site usage for the foreseeable future.

2.1.5.2 Question B

Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy selection still valid?

There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. There have been no significant changes to the standardized risk assessment methodology that could affect the protectiveness of the remedy. Florida CTLs have been updated since the time of the DD (TtNUS, 1999a), and these are ARARs for the site. Toxicity data for selected individual contaminants have also been updated; however, these updates do not affect the protectiveness of the remedy because LUCs limit exposure to human receptors. The baseline ERA concluded that contaminants may pose potential risks to benthic organisms; however, it was determined that remediation of sediments at AOC B would not improve the quality of the benthic habitat and could re-suspend contaminants in water, potentially increasing their bioavailability. The Supplemental RFI/RI Report for eight sites recommended that a NFA DD be prepared for AOC B, with the provision that a future residential scenario be prevented by ICs (B&RE, 1998a). Updated toxicity criteria would not change this condition. The RAOs remain valid.

2.1.5.3 Question C

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

No new ecological receptors or human usage of the site have been identified for AOC B. There is no other information that calls into question the protectiveness of the remedy.

2.1.5.4 Technical Assessment Summary

Based on the data reviewed and the site inspections conducted, the remedy is functioning as intended by the DD (TtNUS, 1999a). There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. There have been no significant changes to the standardized risk assessment methodology that could affect the protectiveness of the remedy. LUCs provide protection to potential human receptors. The baseline ERA concluded that the site poses risks to benthic receptors that cannot be effectively mitigated. There is no other information that calls into question the protectiveness of the remedy.

2.1.6 Issues

This five-year review did not identify any issues that could impact the remedy.

2.1.7 Recommendations and Follow-up Actions

LUCs should remain in place at the site.

2.1.8 Protectiveness Statement

The remedy at AOC B is protective of human health and the environment.

2.1.9 Next Review

The next five-year review for AOC B is required to be completed and signed five years following the signature date of this report

2.2 IR 1 - TRUMAN ANNEX REFUSE DISPOSAL AREA

This section describes the CERCLA five-year review for IR 1, the Truman Annex Refuse Disposal Area.

2.2.1 History and Site Chronology

A list of important historical events and relevant dates in the site chronology is shown below.

Date	Event or Activity
1952 to mid-1960s	Refuse Disposal Area operations
May 1985	IAS Report produced by Envirodyne Engineers, Inc.
March 1987	Verification Study Assessment issued by G&M
January 1991	Preliminary RI Report produced by IT
June 1994	RFI/RI Report issued by IT
March 1996	IRA excavation completed by BEI
January 1998	Supplemental RFI/RI Report for eight sites issued by B&RE
August 1999	Sediment Toxicity Study Report produced by TtNUS
February 2000	Proposed Plan for IR 1 issued by TtNUS
September 2000	DD for IR 1 and IR 8 issued by TtNUS
July 2001	First year of quarterly performance monitoring implemented by TtNUS
January 2003	APM conducted by TtNUS
December 2003	IR 1 Letter Report addressing focused soil investigation issued by TtNUS December 2003
January 2004	APM conducted by REA Remedial Solutions
December 2004	First five-year review conducted by TtNUS
February 2005	APM conducted by REA Remedial Solutions
February 2006	APM conducted by REA Remedial Solutions
January 2007	APM conducted by REA Remedial Solutions
January 2008	APM conducted by REA Remedial Solutions
January 2009	APM conducted by OHC Environmental Engineering
April 2010	APM conducted by OHC Environmental Engineering*
July 2010	Second five-year review conducted by TtNUS
December 2011	APM conducted by ECS*
December 2012	APM conducted by ECS*
December 2013	APM conducted by Battelle*
December 2014	APM conducted by Battelle

*Represents sample data or an investigation covered by this five-year review.

2.2.2 Background

2.2.2.1 Site Description

The Truman Annex Refuse Disposal Area (IR 1) is located on the south shore of Truman Annex on Key West (Figure 2-2). The site covers an area of approximately 7 acres, including an antenna field and area to the immediate north. A chain-link fence surrounds the site and access to IR 1 is

strictly controlled. The shoreline has erosion protection consisting of large concrete rubble, riprap, and armor rock.

From 1952 until the mid-1960s, the Truman Annex Refuse Disposal Area was used for general refuse disposal and open burning. No restrictions were placed on the types of wastes disposed at the site. General refuse, waste paint thinners, and solvents may have been disposed. As a result of these activities, the soils, groundwater, and sediment at the site have been contaminated with metals, PCBs, and pesticides at concentrations greater than action levels.

2.2.2.2 Summary of Sampling Results

Several investigations have been performed at IR 1 since the mid-1980s to identify, confirm, or delineate contamination. In 1986, G&M performed a preliminary investigation at IR 1 (G&M, 1987). Analytical results indicated that metals were present in the groundwater and soil, and that hydrocarbons were present in the groundwater. Based on the results of the preliminary investigation, IT performed a preliminary RI at IR 1 in 1990. The preliminary RI indicated the presence of metals in groundwater and suggested that migration of metals toward the Atlantic Ocean could be occurring. Further investigation was recommended to determine the extent of contamination (IT, 1991).

In 1993, IT performed an RFI/RI that concluded that sediment surrounding the edge of the site had been contaminated with metals, certain pesticides, and PCBs, and that groundwater was contaminated by metals and trace amounts of certain pesticides. Metal contamination in soil at the site also appeared to be extensive. The Final RFI/RI Report prepared by IT recommended additional sampling, the performance of a feasibility study (FS) and an IRA, and conducting a HHRA based on post-IRA sampling data (IT, 1994).

2.2.2.3 1995 Interim Remedial Action

Based on a Draft Supplemental RFI/RI Work Plan in 1995 (ABB, 1995), a delineation study focusing on metals was performed by BEI at IR 1 to supplement the previous data, determine the extent of lead contaminated soil, and delineate the limits of required excavation (BEI, 1995a). BEI then performed an IRA, excavating lead-contaminated soil to a depth of 12 to 18 inches at IR 1, and removing 4,878 cubic yards of soil for off-site treatment and disposal. The IRA reduced the maximum lead concentration in soil from 35,200 mg/kg to 680 mg/kg. Samples were collected from the excavation area to confirm removal of contaminated soil (BEI, 1998).

2.2.2.4 Summary of Risk

In the fall of 1996, B&RE performed the Supplemental RFI/RI sampling at IR 1 (B&RE, 1998a). The Supplemental RFI/RI concluded that elevated concentrations of some contaminants remained at IR 1. Metals were detected with high frequencies in soil at IR 1 and also detected in sediment, surface water, and groundwater. Several VOCs, SVOCs, pesticides, and PCBs were also detected at the site. An HHRA and ERA were performed during the Supplemental RFI/RI. An FS was recommended for IR 1 in the Supplemental RFI/RI to evaluate possible site remedies. However, the HHRA revealed only one scenario (residential) with risks above EPA's carcinogenic target risk range and noncarcinogenic threshold. Therefore, the NAS Key West Partnering Team made the decision to perform a sediment toxicity study rather than an FS to more fully characterize

ecological risks to benthic organisms at IR 1. The Sediment Toxicity Report for IR 1 concluded that potential ecological risks to benthic organisms existed in the vicinity of two sediment sample locations. 4,4'-dichlorodiphenyl trichloroethane (DDT), lead, and copper were elevated at one of the sample locations, while Aroclor 1260 and 4,4'-dichlorodiphenyl dichloroethylene (DDE) were elevated at the other sample location (TtNUS, 1999c).

Based on the HHRA and ERA, site COCs and ECCs, and their respective media at IR 1 are summarized as follows:

Exposure Medium	COC for Human Health Risk	ECC for Ecological Risk
Soil	antimony arsenic iron	copper lead zinc
Groundwater	none	endosulfan I dieldrin gamma-BHC
Surface Water	none	none
Sediment	Arsenic iron Aroclor 1254 Aroclor 1260	4,4'-DDT dieldrin endrin endosulfan I gamma-BHC Aroclor 1260 copper lead zinc

2.2.3 Remedial Actions

2.2.3.1 Remedy Selection

As summarized in the Proposed Plan (TtNUS, 2000a) and documented in the DD for IR 1 and IR 8 (TtNUS, 2000b), the remedy selected for IR 1 was LUCs to prevent contact with human receptors, and performance monitoring of groundwater, sediment, and biota to demonstrate that ecological risk was localized and diminishing with time. The locations for sediment and biota sampling were based on sample results from 10 locations along the shoreline of IR 1 collected in October 1998. These samples were subjected to sediment toxicity tests and chemical analyses. Adverse impacts to the sediment toxicity test organism (*Leptocherus plumulosus)* were observed at 2 of 10 sampling locations (TtNUS, 1999c).

The RAOs for IR 1 are not explicitly stated in the DD, but can be reasonably inferred from the results of the baseline HHRA, ERA, and from the discussion of the selected remedy in the DD, as follows:

- Prevent contact between human receptors and site COCs.
- Confirm that ecological risk is localized and diminishing with time.

2.2.3.2 Remedy Implementation

To address human health risks, LUCs, consisting of limited site access, were implemented. LUCs were developed through LUCIPs. These controls were designed to ensure protection of human health by restricting future site use and accessibility, educating NAS Key West personnel, and maintaining records of contamination. The LUCs documented in the NAS Key West Base Master Plan prevent future residential use at this site. The LUCIP for IR 1 includes the placement and maintenance of signs around the site perimeter which state that dangerous material may be present below the ground surface. Personnel from the NAS Key West Public Works Department are required to visually inspect IR 1 at least once every three months to ensure that LUCs are being implemented and signs are properly maintained. The NAS Key West Public Works Department submits an annual report to FDEP describing the results of the quarterly inspections.

To implement the monitoring program for this remedy, sediment and groundwater samples were collected quarterly for the first year and annually thereafter. Quarterly monitoring began in July 2001 and was completed in April 2002 (TtNUS, 2002a and 2002c). Annual monitoring of sediment and groundwater began in January 2003 (TtNUS, 2003a). Monitoring of ecological receptors, including sediment toxicity testing, was performed in January 2002, and involved the analysis of aquatic vegetation (turtle grass) for metals, pesticides, and PCBs (TtNUS, 2002b). Monitoring of aquatic vegetation or other biota was eliminated after the January 2002 sampling event because although the primary COCs at IR 1 (PCBs and organochlorine pesticides such as DDT, 4,4'-dichlorodiphenyl dichloroethane [DDD], and dieldrin) are long-lived in the environment and are expected to remain in IR 1 sediments for the foreseeable future, the two locations where these compounds were elevated represent relatively small areas in which risk to benthic receptors exists, and the collection of additional biological samples as part of long-term monitoring was not considered necessary (TtNUS, 2004a).

2.2.3.3 Sampling Events since the Last Five-Year Review

Five annual sampling events involving groundwater monitoring have been conducted since the previous five-year review in July 2010. Groundwater monitoring events were conducted in January 2010 (OHC, 2010), December 2011 (ECS, 2012), December 2012 (ECS, 2013), December 2013 (Battelle, 2015), and December 2014. Sediment monitoring was conducted in 2012 (ECS, 2013), 2013 (Battelle, 2015), and 2014 since the 2010 five-year review.

2.2.4 Five-Year Review Process

2.2.4.1 Document Review

Reports and data from monitoring and investigations conducted from 2010 through 2013 were reviewed for this five-year review. The most recent available data report reviewed for this five-year review is the 2013 APM Report (Battelle, 2015). Tables 1 through 33 of the 2013 APM Report present information on optimization of monitoring analyte suites as well as compilations of historical data for the APM sites. These tables are included for reference as Appendix A to this report.

The 2012 APM report set forth the decision rules adopted by the NAS Key West Partnering Team in 2012 for optimizing the sampling program. Appendix A, Table 3 contains the APM optimization rules defined by the Partnering Team. Appendix A, Table 4 highlights the APM optimization

summary and provides a list of the analytes that qualified to be removed from the APM program based on the decision rules. Partnering Team discussions held in July 2013 further revised the optimization rules such that all landfill sites (i.e., SWMU 1, IR 1, IR 7, and IR 8) will require analysis of all compounds from their respective SOB and DDs. Reduced analytical suites for these sites will require further consideration by the NAS Key West Partnering Team (Battelle, 2015).

2.2.4.2 Data Review and Evaluation

Historical surface soil data were summarized and reviewed in the first five-year review (TtNUS, 2004a). Surface soil sampling is not part of the long-term monitoring plan for IR 1; therefore, no new surface soil data have been generated since the last review.

Groundwater and sediment sample locations are presented in Figure 2-2. Compilations of historical data through 2013 for IR 1 are presented in Appendix A, Tables 28 through 31. Table 28 presents groundwater metals concentrations, Table 29 presents sediment metals concentrations, Table 30 presents sediment polycyclic aromatic hydrocarbon (PAH) concentrations, and Table 31 presents sediment pesticides and PCB concentrations. The tables also present compound-specific action levels used in 2013.

Selected key groundwater constituent concentrations are illustrated in Figure 2-3, and summary tables for key sediment metal analytes are shown in Figure 2-4, and summary tables for key PAH, PCB, and pesticide analytes are shown in Figure 2-5. The figures also present the corresponding action levels for the selected analytes. A comparison of action levels with current Florida CTLs is provided in Appendix B. The following sections present groundwater and sediment monitoring data.

2.2.4.2.1 Groundwater Monitoring

The DD does not identify any groundwater COCs at IR 1 (TtNUS, 2000b). The groundwater monitoring program currently addresses metals which are not COCs. Discussion of groundwater metals concentrations is presented in Section 2.2.9. The DD identified groundwater ECCs at IR 1 consisting of the pesticides endosulfan I, dieldrin, and gamma-BHC. Pesticides are not being monitored in groundwater because the pathway of concern for ecological risk is groundwater to sediment, and sediment is being monitored for pesticides.

2.2.4.2.2 Sediment Monitoring

Sediment COCs identified for IR 1 in the DD were Aroclor 1254, Aroclor 1260 and arsenic. Sediment ECCs identified in the DD consist of 4,4'-DDT, dieldrin, endrin, endosulfan I, gamma-BHC (and some daughter products of these pesticides), Aroclor 1260, copper, lead, and zinc (TtNUS, 2000b).

IR 1 sediment has been monitored at eight locations (Figure 2-2), and analyzed for SVOCs, pesticides, PCBs, and metals. Figure 2-4 illustrates selected sediment metals concentrations for three events, January 2003, December 2012, and December 2013. As seen in the figure, selected metal analytes that exceeded action levels in 2003 were generally below, or near action levels by 2013.

Figure 2-5 illustrates concentrations of selected sediment organic analytes for the 2003, 2012, and 2013 sampling events. As is the case for metals, many key organic analytes that exceeded

action levels in 2003 have declined to below action levels, but others remained elevated as of 2013.

2.2.4.3 Site Inspection and Interviews

LUCs are inspected quarterly, and an annual report is prepared and submitted to FDEP. Selected annual LUC compliance reports were reviewed for this five-year review. In addition, a specific site inspection, including interviews, was conducted for the five-year review. Information was recorded on site inspection/interview forms that are presented in Appendix C. No significant issues have been identified. Since access to the site is restricted, trespassing is minimal.

In addition, warning signs are in place around the perimeter of the site, warning base personnel not to disturb the soil because hazardous material may be present below the ground surface.

2.2.5 Technical Assessment

The Comprehensive Five-Year Review Guidance (EPA, 2001) states that the technical assessment section should answer three primary questions, each of which is presented below.

2.2.5.1 Question A

Is the remedy functioning as intended by the decision documents?

The remedy is functioning as intended by the DD. IR 1 is located on an active military base, and access to the base is restricted. In addition, access to IR 1 is prohibited by the National Security Agency (NSA) and the area is rigorously patrolled. NAS Key West personnel perform quarterly visual inspections to ensure adherence to LUCs, and an annual report is submitted to FDEP describing the results of the quarterly inspections. Annual monitoring of groundwater and sediment is conducted and is reported to FDEP. Warning signs are in place around the site perimeter, reducing the occurrence of trespassing and potential exposure. There is no planned change in site usage for the foreseeable future.

Data collected during several sampling events indicate that elevated sediment concentrations of COCs are limited to a small localized area along the shoreline of IR 1. Within the vicinity of this location, concentrations of several chemicals, specifically Aroclor 1260 and PAHs, have been elevated, indicating potential risk to benthic (sediment-dwelling) invertebrate receptors. PCBs and PAHs are long-lived in the environment, and these chemicals are expected to remain in IR 1 sediments for the foreseeable future. Since the location where these compounds are elevated has very limited extent, the existing remedy appears to be protective of ecological receptors and is consistent with findings from previous five year reviews.

2.2.5.2 Question B

Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy selection still valid?

There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. There have been no significant changes to the standardized risk assessment methodology that could affect the protectiveness of the remedy. Florida CTLs have been updated since the time of the DD (TtNUS, 2000b), and these are ARARs for the site. Toxicity

data for selected individual contaminants have also been updated; however, these updates do not affect the protectiveness of the remedy because LUCs limit exposure to human receptors.

The ERA concluded that contaminants may pose potential risks to benthic organisms; however, it was determined that the affected area was small. SQAGs, referenced in FAC Chapter 62-777, are used as the primary screening criteria. A risk management decision was made to accept elevated ecological risk because of the small affected area. Updated toxicity criteria would likely not change this circumstance. The RAOs remain valid.

2.2.5.3 Question C

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

No new ecological receptors or human usage of the site were identified during performance monitoring or during the five-year review.

2.2.5.4 Technical Assessment Summary

Based on the data reviewed and the site inspections conducted, the remedy is functioning as intended by the DD for IR 1 and IR 8 (TtNUS, 2000b). There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. There have been no significant changes to the standardized risk assessment methodology that could affect the protectiveness of the remedy. There is no other information that calls into question the protectiveness of the remedy.

2.2.6 Issues

This five-year review did not identify any issues that could impact the remedy.

2.2.7 Recommendations and Follow-up Actions

The findings of this five-year review support the following recommendations:

- LUCs should remain in place at the site.
- Groundwater and sediment monitoring should be reduced to a quinquennial frequency in support of five year reviews because there are no groundwater COCs and groundwater exposure pathways for ecological receptors are being addressed by sediment monitoring.
- The NAS Key West Partnering Team should develop timelines for implementing these recommendations.

2.2.8 Protectiveness Statement

The remedy is protective of human health and the environment.

2.2.9 Supplemental Information

There are no groundwater COCs at IR 1; however, the APM program requires collection of groundwater samples at IR 1 per the Performance Monitoring Plan (PMP; TtNUS, 2000c), PMP Addendum (Battelle, 2012a) and the Sampling and Analysis Plan Addendum 1 (Battelle, 2012b). Groundwater is monitored annually at four locations for metals (Figure 2-3). Concentrations of two metals (antimony and sodium) have sporadically exceeded action levels since the inception

of monitoring in some wells. As of the 2013 sampling event, only antimony exceeded the project action level of 6 micrograms per liter (μg/L) at two of the four wells (Figure 2-3).

It should be noted that the project action level is based on the primary drinking water maximum contaminant level (MCL) of 6 μg/L for antimony. FAC Chapter 62-777 provides for a CTL equal to 10 times the primary standard for "poor quality" groundwater. The groundwater at IR 1 should qualify as nonpotable GIII groundwater under FAC Chapter 62-520 owing to its high salinity. Since the groundwater is non-potable, it should also qualify for the "poor quality" CTL category under FAC 62-777. This interpretation suggests that an appropriate groundwater action level for antimony would be 60 μg/L, not 6 μg/L. If this was the case, IR 1 would have no groundwater metals action level exceedances. Appendix B presents a comparison of 2014 groundwater CTLs with the project action levels.

2.2.10 Next Review

The next five-year review for IR 1 is required to be completed and signed five years following the signature date of this report.

2.3 IR 3 - TRUMAN ANNEX DDT MIXING AREA

This section describes the CERCLA five-year review for IR 3, the Truman Annex DDT Mixing Area.

2.3.1 History and Site Chronology

A list of important IR 3 historical events and relevant dates in the site chronology is shown below. The identified events are intended to be illustrative, rather than comprehensive.

Date	Event or Activity
1940s to early 1970s	DDT mixing operations
May 1985	IAS Report produced by Envirodyne Engineers
March1987	Verification study assessment produced by G&M
January 1991	Preliminary RI Report issued by IT
June 1994	RFI/RI Report issued by IT
October 1995	IRA completed by BEI
January 1998	Supplemental RFI/RI Report for eight sites issued by TtNUS
April 1999	DD for IR 3, IR 7, and AOC B issued by TtNUS
December 2004	First five-year review conducted by TtNUS
March 2008	Well Abandonment Report for various sites issued by TtNUS
July 2010	Second five-year review conducted by TtNUS

2.3.2 Background

2.3.2.1 Site Description

The Truman Annex DDT Mixing Area (IR 3) is located at the former site of NAS Key West Building 265. The 0.25-acre site is located approximately 1,100 feet from the coastline. The topography of the site is flat, and the site is covered with turf grass and is surrounded by parking lots, paved streets, residential areas, and other developed areas (Figure 2-6). The site is underlain by highly

permeable soil with no surface water drainage or holding features present. The water table occurs at approximately 5 ft below land surface (bls). From the 1940s to the early 1970s, the location was used as a DDT mixing area. Powdered DDT concentrate was mixed with water and temporarily stored in 55-gallon drums both inside and outside the former building. The mixed solution was then transferred to trucks for dispersal. Discharges at the site were from accidental spills. Soil and groundwater at the site have been contaminated by pesticides, primarily DDT, DDE, and DDD (B&RE, 1998a).

2.3.2.2 Summary of Sampling Results

In 1986, G&M conducted an initial investigation of IR 3. Surface soil samples were analyzed for pesticides. All samples were collected from the area that was later excavated by BEI. Analytical results indicated that DDT and other pesticides, such as BHC, were present (G&M, 1987). In 1991, IT conducted a Preliminary RI. Analysis of groundwater samples from the site indicated that cadmium and seven different pesticide compounds were present in concentrations above established standards. The pesticide concentrations in the groundwater suggested that leaching could be occurring at the site (IT, 1991).

In 1993, IT conducted soil and groundwater sampling during the RFI/RI at this site. Characterization of contamination at the site indicated that surface soil and groundwater were impacted by metals (i.e., lead and arsenic) and pesticides. The source of groundwater contamination appeared to be the leaching of metals and pesticides from the soil. The Final RFI/RI prepared by IT recommended installing new monitoring wells and performing additional soil sampling to further delineate the extent of contamination, conducting an IRA to remove or cap contaminated surface soils, and performing a preliminary FS to determine appropriate remedial actions to prevent further migration of contaminants (IT, 1994).

2.3.2.3 1995 Interim Remedial Action

The IRA objective for IR 3 was contaminant source removal to prevent further migration of wastes into other media. To accomplish this objective, the scope of work for IR 3 consisted of the following elements: excavation of pesticide, lead, and arsenic-contaminated soils; transportation of waste to a RCRA permitted treatment/disposal facility; backfilling with clean fill; and stabilizing with topsoil and sod (BEI, 1998).

In 1995, 735 cubic yards of DDT-contaminated soil were removed from the site for treatment and disposal. The remediated area was then backfilled. Confirmatory samples were collected from locations on the excavation floor and sidewalls. There were small areas of IR 3 that were not excavated because of the presence of permanent structures such as sidewalks, fences and utility poles. As a result, locations with elevated pesticide levels did remain (BEI, 1998).

2.3.2.4 Summary of Risk

Following completion of the IRA, a baseline HHRA and an ERA were performed as part of the Supplemental RFI/RI for eight sites (B&RE, 1998a). The HHRA indicated that contaminants were present in surface soil at concentrations indicating adverse health effects could occur for the hypothetical future resident and occupational worker. Arsenic, DDD, DDE, and DDT were the

main contributors to the carcinogenic risk, and arsenic and DDT were the main contributors to the non-carcinogenic risk (B&RE, 1998a).

The ERA indicated the absence of a complete exposure pathway for ecological receptors at IR 3. Although groundwater contamination was present at IR 3, it was considered unlikely that the contaminant plume could travel the distance necessary to reach the coastline. The Supplemental RFI/RI for eight sites concluded that the potential for ecological impacts did not exist at IR 3 (B&RE, 1998a).

Based on the HHRA and BRA, site COCs and ECCs, and their respective media at IR 3 are summarized as follows:

Exposure Medium	COC for Human Health Risk	ECC for Ecological Risk
Soil	arsenic beryllium iron 4,4'-DDD 4,4'-DDE 4,4'-DDT	none
Groundwater	none	none
Surface Water	none	none
Sediment	none	none

2.3.3 Remedial Actions

2.3.3.1 Remedy Selection

The selected remedy for IR 3, presented in the Proposed Plan (TtNUS, 1998b) and documented in the DD and Responsiveness Summary for IR 3, IR 7, and AOC B (TtNUS, 1999a), was to install an asphalt cap to limit direct exposure to remaining soil contamination and to reduce migration of contaminants to groundwater, and to institute LUCs. The asphalt cap provides sound engineering controls in accordance with Section 62-785.680(2)(b)4 of the FAC. The asphalt cap addresses FAC requirements to prevent human exposure and limit water infiltration by cutting off potential contact exposure to contaminated soil at the site and reducing the percolation of precipitation through the soil that could mobilize the contaminants (TtNUS, 1999a).

The RAO for IR 3 is not explicitly stated in the DD, but can be reasonably inferred from the results of the baseline HHRA, ERA, and from the risk management decisions described in the DD, as follows:

- Prevent contact between human receptors and site COCs.

2.3.3.2 Remedy Implementation

IR 3 is located on an active military base with no planned change in site usage for the foreseeable future. The IRA conducted in 1995 removed most of the contaminated soil from the site. The asphalt cap provides engineering controls, preventing human exposure and limiting water infiltration. LUCs were developed through LUCIPs, and were designed to ensure protection of human health and the environment by restricting future site use and accessibility, educating NAS

Key West personnel, and maintaining records of contamination. The LUCs documented in the NAS Key West Base Master Plan prevent future residential use at IR 3. The LUCIP for IR 3 includes maintenance of the asphalt cap over the site.

Personnel from the NAS Key West Public Works Department are required to visually inspect IR 3 at least once every three months to ensure that all LUCs are being implemented and properly maintained. The NAS Key West Public Works Department submits an annual report to FDEP describing the results of the quarterly inspections.

2.3.4 Five-Year Review Process

2.3.4.1 Document Review

Because the selected remedy was to install an asphalt cap to limit direct exposure to remaining soil contamination, to reduce migration of contaminants to groundwater, and to institute LUCs, no sampling has been performed at IR 3 in the past five years and no documents have been issued. Therefore, a document review for IR 3 is not applicable.

2.3.4.2 Data Review and Evaluation

No analytical data have been generated since the Supplemental RFI/RI for eight sites, and thus, no data have been generated since the last five-year review.

2.3.4.3 Site Inspection and Interviews

LUCs are inspected quarterly, and an annual report is prepared and submitted to FDEP. Selected annual LUC compliance reports were reviewed for this five-year review. In addition, a specific site inspection, including interviews, was conducted for the five-year review. Information was recorded on site inspection/interview forms that are presented in Appendix C. No significant issues have been identified. Since access to the site is restricted, trespassing is minimal. The site has been inspected on numerous occasions since the asphalt cap was installed. No significant issues have been identified at any time regarding the site.

2.3.5 Technical Assessment

The Comprehensive Five-Year Review Guidance (EPA, 2001) states that the technical assessment section should answer three primary questions, each of which is presented below.

2.3.5.1 Question A

Is the remedy functioning as intended by the decision documents?

The remedy is functioning as intended by the DD and Responsiveness Summary for IR 3 (TtNUS, 1999a). NAS Key West personnel perform quarterly visual inspections to ensure that the asphalt cap is being maintained, and an annual report is submitted to FDEP describing the results. There is no planned change in site usage for the foreseeable future.

2.3.5.2 Question B

Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy selection still valid?

There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. There have been no significant changes to the standardized risk

assessment methodology that could affect the protectiveness of the remedy. Florida CTLs have been updated since the time of the DD (TtNUS, 1999a), and these are ARARs for the site. Toxicity data for selected individual contaminants have also been updated; however, these updates likely do not affect the protectiveness of the remedy because LUCs limit exposure to human receptors. The baseline ERA concluded that there is no complete pathway for ecological receptors. The RAOs remain valid.

2.3.5.3 Question C

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

No new receptors have been identified for IR 3. No weather-related events have affected the protectiveness of the remedy. There is no known information that calls into question the protectiveness of the remedy.

2.3.5.4 Technical Assessment Summary

Based on the data reviewed and the site inspections, the remedy is functioning as intended by the DD. There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. There have been no significant changes to the standardized risk assessment methodology that could affect the protectiveness of the remedy. There is no other information that calls into question the protectiveness of the remedy.

2.3.6 Issues

This five-year review did not identify any issues that could impact the remedy.

2.3.7 Recommendations and Follow-up Actions

The selected remedy (asphalt cap and LUCs) should be maintained.

2.3.8 Protectiveness Statement

The remedy is protective of human health and the environment.

2.3.9 Next Review

The next five-year review for IR 3 is required to be completed and signed five years following the signature date of this report.

2.4 IR 7 - FORMER FLEMING KEY NORTH LANDFILL

This section describes the five-year review for IR 7, the Former Fleming Key North Landfill.

2.4.1 History and Site Chronology

A list of IR 7 important historical events and relevant dates in the site chronology is shown below.

Date	Event or Activity
1952 to 1962	Fleming Key North Landfill, Navy and City of Key West operations
1979 to 1999	U.S. Department of Agriculture (USDA) Animal Import Center operations
May 1985	IAS Report produced by Envirodyne Engineers
March 1987	Verification Study Assessment produced by G&M
January 1991	Preliminary RI Report issued by IT
June 1994	RFI/RI Report issued by IT

Date	Event or Activity
October 1995	IRA completed by BEI
January 1998	Supplemental RFI/RI Report for eight sites issued by B&RE
October 1998	Proposed Plan for IR 7 issued by TtNUS
April 1999	DD and Responsiveness Summary for IR 3, IR 7, and AOC B issued by TtNUS
April 2000	First year of quarterly performance monitoring implemented by TtNUS
January 2002	APM conducted by TtNUS
October 2002	Environmental baseline survey conducted by TtNUS at Harry S. Truman Animal Import Center
January 2003	APM conducted by TtNUS
January 2004	APM conducted by REA
December 2004	First five-year review conducted by TtNUS
February 2005	APM conducted by REA Remedial Solutions
February 2006	APM conducted by REA Remedial Solutions
January 2007	APM conducted by REA Remedial Solutions
January 2008	APM conducted by REA Remedial Solutions
January 2009	APM conducted by OHC Environmental Engineering
April 2010	APM conducted by OHC Environmental Engineering *
July 2010	Second five-year review conducted by TtNUS
December 2011	APM conducted by ECS*
December 2012	APM conducted by ECS*
December 2013	APM conducted by Battelle*
December 2014	APM conducted by Battelle

*Includes sample data or investigation covered by this five-year review.

2.4.2 Background

2.4.2.1 Site Description

IR 7, the former Fleming Key North Landfill, is located in the northern portion of Fleming Key, north of the island of Key West (Figure 2-7). The site, a relatively flat 30-acre area, was used from 1952 to 1962 as a landfill for NAS Key West and the City of Key West. In 1979, the U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS) constructed the Harry S. Truman Animal Import Center over 18.4 acres of the landfill. During the construction phase, wastes were excavated and transferred to an area immediately to the west of the construction site and buried under a soil/rock cover.

The Animal Import Center operated as a livestock quarantine facility from 1979 until 1999. The facility was decommissioned by USDA in 2002 and ownership reverted back to the Navy. Currently, the entire landfill area is covered with soil and is vegetated by grass, weeds, and trees. Approximately 4,000 to 5,000 tons of unknown wastes were disposed of annually at the site. The open trench and fill method was used during landfill operations; trenches were approximately 25 feet wide, 10 feet deep, and 500 to 1,000 feet in length typically containing about 3 feet of sea water in the bottom. Wastes disposed of in the trenches were covered at the end of each working day with soil. Malathion, DDT, and diesel fuel were sprayed on the landfill to control pests and insects. The soil, sediment, groundwater, and surface water have been impacted by organic and inorganic contaminants that exceed action levels. Fill material placed on site has created a topographic high around the Animal Import Center. The area surrounding this feature slopes gradually toward Man of War Harbor to the west and the Gulf of Mexico to the east. Lining the shore of the Gulf are large concrete boulders to prevent shoreline erosion. Along the shore of

North Fleming Key and to the northwest are woods and mangroves. To the west are mangroves and small dirt roads. South of the site is an ammunitions storage area for the Navy. North of the site is a U.S. Army Special Forces training facility (B&RE, 1998a).

2.4.2.2 Summary of Sampling Results

In 1986, G&M conducted an initial investigation of IR 7 that involved installing and sampling four shallow monitoring wells. SVOCs and VOCs were found in samples from the wells. Analyses of groundwater for metals detected copper, mercury, and arsenic (G&M, 1987). In 1990, IT conducted a preliminary RI, which included the installation of five soil borings (converted to monitoring wells) and the excavation of 21 test pits to characterize the waste types and distribution patterns. Waste consisted of household, construction, and electrical debris, and scrap metal. The majority of the waste was household debris, including tires, glass, plastic, and basic household trash. Construction debris included concrete slabs, steel cables, and piping. Electrical debris consisted of electrical conduit, wire, and low-voltage batteries. Scrap metal waste included sheet metal and refrigerator parts. Groundwater samples from the site indicated metals (i.e., antimony, chromium, cadmium, mercury, and lead) were present in concentrations above established standards. Wells located downgradient along the shoreline within the landfill area had the highest concentrations of metals (IT, 1991).

In 1993, IT conducted soil, sediment, surface water, and groundwater sampling during the RFI/RI at this site. Characterization of contamination at the site indicated that groundwater appeared to be impacted by cyanide, metals (i.e., arsenic, cadmium, lead, and mercury), and pesticides. Mercury and cyanide also were detected in surface water at concentrations exceeding surface water quality standards.

The Final RFI/RI prepared by IT recommended continued monitoring of the site for possible migration of contaminants, grading the west side of the site to provide drainage and prevent ponding of water over the waste material, maintaining the soil and vegetative cover for the site, performing a preliminary ERA, and conducting a HHRA based on monitoring data (IT, 1994).

2.4.2.3 1995 Interim Remedial Action

In September 1995, BEI performed an IRA at IR 7 to prevent ponding of rainwater and minimize infiltration through the waste. Clean topsoil was imported to fill low areas and promote runoff. A vegetative cover was established to prevent erosion. BEI mowed the non-wooded surface of IR 7 to visually identify low spots to be filled with clean topsoil. 40 cubic yards of topsoil were placed and sodded with grass to meet the objectives of the IRA (BEI, 1998).

2.4.2.4 Summary of Risk

An HHRA and ERA were performed as part of the Supplemental RFI/RI for eight sites. Contaminants were not present at sufficient concentrations to cause adverse non-carcinogenic health effects to any current potential receptors or future excavation workers. Although some cancer risks exceeded FDEP's target risk, the cancer risks estimated for the current potential or future receptors were below EPA's target risk range. Adverse non-carcinogenic health effects may occur for the hypothetical future resident. Antimony was the main contributor to the non-carcinogenic risk (B&RE, 1998a).

The ERA at IR 7 indicated that site-related contaminants had not accumulated in vegetation, crabs, or lobsters, and potential ecological risk from contaminants in groundwater, surface water, soil, and sediment was negligible (B&RE, 1998a).

Based on the HHRA and BRA, site COCs and ECCs, and their respective media at IR 7 are summarized as follows:

Exposure Medium	COC for Human Health Risk	ECC for Ecological Risk
Soil	antimony	none
Groundwater	none	none
Surface Water	antimony	none
Sediment	none	none

2.4.3 Remedial Actions

2.4.3.1 Remedy Selection

The remedy for IR 7 was presented in the Proposed Plan (TtNUS, 1998c) and documented in the DD and Responsiveness Summary for IR 3, IR 7, and AOC B (TtNUS, 1999a). The selected remedy includes groundwater monitoring to detect any contaminant migration from the landfill. In addition, LUCs were implemented to reduce the potential risk to human health and the environment associated with the remaining wastes in the landfill (TtNUS, 1999a).

The RAO for IR 7 is not explicitly stated in the DD, but can be reasonably inferred from the results of the baseline HHRA, ERA, and from the risk management decisions described in the DD, as follows:

- Prevent contact between human receptors and site COCs.

2.4.3.2 Remedy Implementation

LUCs were developed by the NAS Key West Partnering Team and implemented through LUCIPs. These controls were designed to ensure protection of human health and the environment by restricting future site use and accessibility, educating NAS Key West personnel, and maintaining records of contamination. The LUCs documented in the NAS Key West Base Master Plan prevent future residential use at this site. The LUCIP for IR 7 includes the placement and maintenance of signs along the perimeter of the site warning against dumping and trespassing.

Personnel from the NAS Key West Public Works Department are required to visually inspect IR 7 at least once every three months to ensure that all LUCs are being implemented and signs are properly maintained. The NAS Key West Public Works Department submits an annual report to FDEP describing the results of the quarterly inspections.

To implement the monitoring program for this remedy, groundwater samples were collected quarterly for the first year and annually thereafter. The quarterly monitoring began in April 2000 and was completed in January 2001 (TtNUS, 2001a). Groundwater samples have been collected annually from 2002 through 2014.

2.4.3.3 Sampling Events since the Last Five-Year Review

Five annual sampling events involving the monitoring of groundwater have been conducted since the previous five-year review in July 2010; these events were conducted in January 2010 (OHC, 2010), December 2011 (ECS, 2012), December 2012 (ECS 2013), December 2013 (Battelle, 2015), and December 2014.

2.4.4 Five-Year Review Process

2.4.4.1 Document Review

Reports and data from monitoring and investigations conducted from 2010 through 2013 were reviewed for this five-year review. The most recent available data report reviewed for this five-year review is the 2013 APM Report (Battelle, 2015). Tables 1 through 33 of the 2013 APM Report present information on optimization of monitoring analyte suites as well as compilations of historical data for the APM sites. These tables are included for reference as Appendix A to this report.

The 2012 APM report set forth the decision rules adopted by the NAS Key West Partnering Team in 2012 for optimizing the sampling program. Appendix A, Table 3 contains the APM optimization rules defined by the Partnering Team. Appendix A, Table 4 highlights the APM optimization summary and provides a list of the analytes that qualified to be removed from the APM program based on the decision rules. Partnering Team discussions held in July 2013 further revised the optimization rules such that all landfill sites (i.e., SWMU 1, IR 1, IR 7, and IR 8) will require analysis of all compounds from their respective SOB and DDs. Reduced analytical suites for these sites will require further consideration by the NAS Key West Partnering Team (Battelle, 2015).

2.4.4.2 Data Review and Evaluation

There are no groundwater COCs or ECCs identified in the DD for IR 7 (TtNUS, 1999a); however, the Performance Monitoring Plan recommended the collection and analysis of groundwater samples from four locations quarterly for the first year of monitoring and annually for the next nine years, and groundwater samples were to be analyzed for 40 Code of Federal Regulations , Part 264 Appendix IX (referenced hereafter as “Appendix IX”) VOCs, SVOCs, pesticides, and target analyte list (TAL) metals (TtNUS, 2000c). An addendum to the Performance Monitoring Plan (TtNUS, 2002d) reduced the number of monitoring wells to one well sampled annually. Discussion of groundwater monitoring for non-COCs is presented in Section 2.4.9.

2.4.4.3 Site Inspection and Interviews

LUCs are inspected quarterly, and an annual report is prepared and submitted to FDEP. Selected annual LUC compliance reports were reviewed for this five-year review. In addition, a specific site inspection, including interviews, was conducted for the five-year review. Information was recorded on site inspection/interview forms that are presented in Appendix C. No significant issues have been identified. Since access to the site is restricted, trespassing is minimal. In addition, signs are in place around the site perimeter, warning that hazardous material could be present below ground surface.

2.4.5 Technical Assessment

The Comprehensive Five-Year Review Guidance (EPA, 2001) states that the technical assessment section should answer three primary questions, each of which is presented below.

2.4.5.1 Question A

Is the remedy functioning as intended in the decision documents?

The remedy is functioning as intended in the DD, protecting human health and the environment. IR 7 is located on an active military base, and access to the base is restricted. NAS Key West personnel perform quarterly visual inspections to ensure adherence to LUCs, and an annual report is submitted to FDEP describing the results of the quarterly inspections. Annual monitoring of groundwater is conducted and is reported to FDEP. In addition, warning signs are in place around the site perimeter, reducing the chance of potential exposure. There is no planned change in site usage for the foreseeable future.

2.4.5.2 Question B

Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy selection still valid?

There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. There have been no significant changes to the standardized risk assessment methodology that could affect the protectiveness of the remedy. Florida CTLs have been updated since the time of the DD (TtNUS, 1999a), and these are ARARs for the site. Toxicity data for selected individual contaminants have also been updated; however, these updates do not affect the protectiveness of the remedy because LUCs limit exposure to human receptors. The ERA concluded that risks to ecological receptors are negligible. Updated toxicity criteria would likely not change this conclusion. The RAOs remain valid.

2.4.5.3 Question C

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

No new ecological receptors or human usage of the site were identified during performance monitoring or during the five-year review. There is no known information that calls into question the protectiveness of the remedy.

2.4.5.4 Technical Assessment Summary

Based on the data reviewed and the site inspections, the remedy is functioning as intended by the DD. There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. There have been no significant changes to the standardized risk assessment methodology that could affect the protectiveness of the remedy. There is no other information that calls into question the protectiveness of the remedy.

2.4.6 Issues

This five-year review did not identify any issues that could impact the remedy.

2.4.7 Recommendations and Follow-up Actions

The findings of this five-year review support the following recommendations:

- LUCs should remain in place at the site.
- Groundwater sampling should be reduced to a quinquennial frequency to support future five year reviews because groundwater pathways to human receptors are rendered incomplete by LUCs.
- The NAS Key West Partnering Team should develop timelines for implementing these recommendations.

2.4.8 Protectiveness Statement

The remedy is protective of human health and the environment.

2.4.9 Supplemental Information

There are no groundwater COCs or ECCs identified in the DD for IR 7 (TtNUS, 1999a); however, the PMP recommended the collection and analysis of groundwater samples from four locations quarterly for the first year of monitoring and annually for the next nine years, and groundwater samples were to be analyzed for Appendix IX VOCs, SVOCs, pesticides, and TAL metals (TtNUS, 2000c). However, analyses of selected chemical fractions were reduced and the sampling of three monitoring wells was discontinued due to few action level exceedances during the first year of monitoring (TtNUS, 2001a).

The 2013 APM program required collection of groundwater at IR 7 per the Performance Monitoring Plan Addendum (Battelle, 2012a) and the Sampling and Analysis Plan Addendum 1 (Battelle, 2012b). One monitoring well (I7MW7-03) at IR 7 (Figure 2-7) was sampled in December 2013 for metals (Battelle, 2015).

The 2013 groundwater sample was analyzed for a reduced list of TAL metals, as well as tin. Selected historical groundwater metals concentrations are illustrated in Figure 2-8. Three of the nine TAL metals were detected; no detected concentrations exceeded the groundwater action levels. Two metals (iron and manganese) were detected above surface water action levels (Figure 2-8).

It should be noted that the project action levels are based in part on primary drinking water MCLs. FAC Chapter 62-777 provides for a CTL equal to 10 times the primary standard for “poor quality” groundwater. The groundwater at IR 7 should qualify as non-potable GIII groundwater under FAC Chapter 62-520 owing to its high salinity. Since the groundwater is non-potable, it should also qualify for the “poor quality” CTL category under FAC 62-777. This interpretation would enable the application of less stringent CTLs for certain groundwater analytes. Appendix B presents a comparison of 2014 groundwater CTLs with the project action levels.

Historically, four monitoring wells were sampled, and this has now been reduced to one well. It is not clear whether sufficient groundwater characterization has occurred to fully delineate groundwater pathways. This potential concern is mitigated by the fact that no potential groundwater pathways appear to be complete. LUCs prevent exposure to human receptors, and the baseline ERA concluded that risk to ecological receptors was negligible.

2.4.10 Next Review

The next five-year review for IR 7 is required to be completed and signed five years following the signature date of this report.

2.5 IR 8 - FORMER FLEMING KEY SOUTH LANDFILL

This section describes the CERCLA five-year review for IR 8, the Former Fleming Key South Landfill.

2.5.1 History and Site Chronology

A list of IR 8 important historical events and relevant dates in the site chronology is shown below. The identified events are intended to be illustrative, rather than comprehensive.

Date	Event or Activity
1948 to 1951	Fleming Key South Landfill, Dredgers Key operations
1962 to 1982	Fleming Key South Landfill, Navy operations
1968 to 1982	Fleming Key South Landfill, Navy and City of Key West operations
May 1985	IAS Report issued by Envirodyne Engineers, Inc.
March 1987	Verification study assessment produced by G&M
January 1991	Preliminary RI Report issued by IT
June 1994	RFI/RI Report issued by IT
August 1997	Shoreline protection system installation completed by BEI
January 1998	Supplemental RFI/RI Report for eight sites issued by B&RE
August 1999	Sediment Toxicity Study Report produced by TtNUS
March 2000	Proposed Plan for IR 8 issued by TtNUS
September 2000	DD for IR 1 and IR 8 issued by TtNUS
July 2001	First year of quarterly performance monitoring implemented by TtNUS
January 2003	APM conducted by TtNUS
January 2004	APM conducted by REA Remedial Solutions
December 2004	First five-year review conducted by TtNUS
February 2005	APM conducted by REA Remedial Solutions
February 2006	APM conducted by REA Remedial Solutions
January 2007	APM conducted by REA Remedial Solutions
January 2008	APM conducted by REA Remedial Solutions
January 2009	APM conducted by OHC Environmental Engineering
April 2010	APM conducted by OHC Environmental Engineering *
July 2010	Second five-year review conducted by TtNUS
December 2011	APM conducted by ECS*
December 2012	APM conducted by ECS*
December 2013	APM conducted by Battelle*
December 2014	APM conducted by Battelle

*Includes sample data or investigation covered by this five-year review.

2.5.2 Background

2.5.2.1 Site Description

The Fleming Key South Landfill (IR 8) covers approximately 45 acres in the southwest portion of Fleming Key (Figure 2-9). The southeast portion of the site is bordered by the City of Key West Sewage Treatment Plant. A munitions storage area is located along the east boundary of the site. The remainder of the site is bordered by the Man of War Harbor and Fleming Key Cut. A closed canopy of Australian pines covers most of the site.

Waste materials and fill from Sigsbee Key (formerly Dredgers Key) were disposed at the site between 1948 and 1951. As much as 8,000 tons of unknown waste were reportedly disposed annually at the landfill between 1962 and 1982. Waste disposal activities of the City of Key West were combined with those of the Navy from 1968 to 1982 at this site. The open trench disposal method was practiced at this site, with the trenches being constructed in a manner similar to that used at Fleming Key North Landfill (IR 7). The trenches were partly full of seawater when the wastes were disposed. Wet garbage was placed directly into one end of the trench and combustible wastes were taken to the west portion of the site and burned. The ashes and unburned wastes were then placed in the rest of the trench (B&RE, 1998a).

2.5.2.2 Summary of Sampling Results

G&M performed an initial investigation at IR 8 in 1986 involving the installation of five shallow monitoring wells (G&M, 1987). Based on the results of this investigation, IT conducted a preliminary RI in 1990 that included soil and groundwater sampling (IT, 1991). In 1993, an RFI/RI was performed for characterization of contamination at the site. The RFI/RI indicated that groundwater and sediment appeared to be extensively impacted by metals. The Final RFI/RI Report recommended that: receptor identification and tissue analysis be performed to confirm uptake of contaminants; an IRA be performed to prevent further contact between the surface water and the waste materials along the shoreline; a preliminary FS be conducted; and a HHRA be performed based on post-IRA data (IT, 1994).

2.5.2.3 Summary of Risk

In 1996, the Supplemental RFI/RI was performed by B&RE (B&RE, 1998a). Metals and pesticides were found to be the most widespread contaminants detected at the site. VOCs were detected in sediment and groundwater. SVOCs were detected in sediment, surface water, and groundwater. PCBs were detected, to a limited extent, in sediment and surface water. An HHRA and ERA were performed at IR 8. Two scenarios (residential and trespasser adolescent) were above the hazard index threshold for non-carcinogenic risk. The ERA concluded that risks at IR 8 were primarily confined to benthic organisms from contamination in sediment. The Supplemental RFI/RI recommended that an FS be conducted at IR 8, and include toxicity tests to determine whether the concentration of chemicals detected in sediments were toxic to benthic organisms (B&RE, 1998a).

Because of low human health risks, the NAS Key West Partnering Team decided to perform a sediment toxicity study at IR 8 rather than an FS. The Sediment Toxicity Report for Sites IR 1 and IR 8 (TtNUS, 1999c) concluded that potential ecological risks from site-related contaminants appeared to be negligible.

Based on the HHRA and ERA, site COCs and ECCs, and their respective media at IR 8 are summarized as follows:

Exposure Medium	COC for Human Health Risk	ECC for Ecological Risk
Soil	none	none
Groundwater	none	none
Surface Water	arsenic	none

	antimony iron	
Sediment	arsenic antimony iron thallium	copper lead zinc

2.5.2.4 Shoreline Protection System

In February 1997, BEI began installation of a shoreline protection system to establish a stable shoreline along the landfill perimeter to prevent debris from being washed into the harbor by erosion. By August 1997, the shoreline structure had been fully installed (BEI, 1998).

2.5.3 Remedial Actions

2.5.3.1 Remedy Selection

The Proposed Plan for Fleming Key South Landfill (TtNUS, 2000d) summarizes the selected remedy for IR 8 and the DD documents the selected remedy (TtNUS, 2000b). The remedy involves LUCs with performance monitoring of groundwater. The remedy addresses remaining contamination in groundwater, and the LUCs are designed to eliminate or reduce exposure pathways by limiting site access (TtNUS, 2000b).

The RAO for IR 8 is not explicitly stated in the DD, but can be reasonably inferred from the results of the baseline HHRA, ERA, and from the risk management decisions described in the DD, as follows:

- Prevent contact between human receptors and site COCs.

2.5.3.2 Remedy Implementation

LUCs were developed by the NAS Key West Partnering Team and implemented through LUCIPs. These controls were designed to ensure protection of human health and the environment by restricting future site use and accessibility, educating NAS Key West personnel, and maintaining records of contamination. The LUCs documented in the NAS Key West Base Master Plan prevent future residential use at this site. The LUCIP for IR 8 includes the placement and maintenance of signs around the site perimeter warning against dumping and trespassing. Personnel from the NAS Key West Public Works Department are required to visually inspect IR 8 at least once every three months to ensure that all LUCS are being implemented and properly maintained. The NAS Key West Public Works Department submits an annual report to FDEP describing the results of the quarterly inspections.

To implement the monitoring program for this remedy, groundwater samples were collected quarterly for the first year and annually thereafter. The quarterly monitoring began in July 2001 and was completed in April 2002 (TtNUS, 2002a). The first annual event was performed in 2003 and has continued thereafter.

2.5.3.3 Sampling Events since the Last Five-Year Review

Five annual sampling events involving groundwater monitoring have been conducted since the previous five-year review in July 2010; these events were conducted in January 2010 (OHC,

2010), December 2011 (ECS, 2012), December 2012 (ECS, 2013), December 2013 (Battelle, 2015), and December 2014.

2.5.4 Five-Year Review Process

2.5.4.1 Document Review

Reports and data from monitoring and investigations conducted from 2010 through 2013 were reviewed for this five-year review. The most recent available data report reviewed for this five-year review is the 2013 APM Report (Battelle, 2015). Tables 1 through 33 of the 2013 APM Report present information on optimization of monitoring analyte suites as well as compilations of historical data for the APM sites. These tables are included for reference as Appendix A to this report.

The 2012 APM report set forth the decision rules adopted by the NAS Key West Partnering Team in 2012 for optimizing the sampling program. Appendix A, Table 3 contains the APM optimization rules defined by the Partnering Team. Appendix A, Table 4 highlights the APM optimization summary and provides a list of the analytes that qualified to be removed from the APM program based on the decision rules. Partnering Team discussions held in July 2013 further revised the optimization rules such that all landfill sites (i.e., SWMU 1, IR 1, IR 7, and IR 8) will require analysis of all compounds from their respective SOB and DDs. Reduced analytical suites for these sites will require further consideration by the NAS Key West Partnering Team (Battelle, 2015).

2.5.4.2 Data Review and Evaluation

The DD did not identify groundwater COCs or ECCs (TtNUS, 2000b); however, the APM program required collection of groundwater at IR 8 per the Performance Monitoring Plan Addendum (Battelle, 2012a) and the Sampling and Analysis Plan Addendum 1 (Battelle, 2012b). Discussion of groundwater monitoring for non-COCs is presented in Section 2.5.9.

2.5.4.3 Site Inspection and Interviews

LUCs are inspected quarterly, and an annual report is prepared and submitted to FDEP. Selected annual LUC compliance reports were reviewed for this five-year review. In addition, a specific site inspection, including interviews, was conducted for the five-year review. Information was recorded on site inspection/interview forms that are presented in Appendix C. No significant issues have been identified. Since access to the site is restricted, trespassing is minimal.

2.5.5 Technical Assessment

The Comprehensive Five-Year Review Guidance (EPA, 2001) states that the technical assessment section should answer three primary questions, each of which is presented below.

2.5.5.1 Question A

Is the remedy functioning as intended by the decision documents?

The remedy to protect human health and the environment is functioning as intended. IR 8 is located on an active military base, and access to the base is restricted. NAS Key West personnel perform quarterly visual inspections to ensure adherence to LUCs, and an annual report is submitted to FDEP describing the results of the quarterly inspections. The shoreline protection system is functioning as intended by maintaining a stable shoreline along the landfill perimeter

and preventing debris from being washed into the harbor by erosion. Annual monitoring of groundwater is conducted and is reported to FDEP. In addition, warning signs are in place around the site perimeter, reducing the likelihood of trespassing and potential exposure. There is no planned change in site usage for the foreseeable future.

2.5.5.2 Question B

Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy selection still valid?

There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. There have been no significant changes to the standardized risk assessment methodology that could affect the protectiveness of the remedy. Florida CTLs have been updated since the time of the DD (TtNUS, 1999a), and these are ARARs for the site. Toxicity data for selected individual contaminants have also been updated; however, these updates likely do not affect the protectiveness of the remedy because LUCs limit exposure to human receptors.

The Sediment Toxicity Report for Sites IR 1 and IR 8 (TtNUS, 1999c) concluded that potential ecological risks from site-related contaminants appeared to be negligible.

The RAOs remain valid.

2.5.5.3 Question C

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

No new ecological receptors or human usage of the site were identified during performance monitoring or during the five-year review. No weather-related events have affected the protectiveness of the remedy.

2.5.5.4 Technical Assessment Summary

Based on the data reviewed and the site inspections, the remedy is functioning as intended by the DD for IR 8 (TtNUS, 2000b). There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. There have been no significant changes to the standardized risk assessment methodology that could affect the protectiveness of the remedy.

The bioavailability and toxicity of IR 8 sediment contamination to benthos was not assessed during the baseline ERA. The Sediment Toxicity Report for Sites IR 1 and IR 8 (TtNUS, 1999c) concluded that potential ecological risks from site-related contaminants appeared to be negligible.

There is no other information that calls into question the protectiveness of the remedy.

2.5.6 Issues

This five-year review did not identify any issues that could impact the remedy.

2.5.7 Recommendations and Follow-up Actions

The findings of this five-year review support the following recommendations:

- LUCs should remain in place at the site.

- Groundwater sampling should be reduced to a quinquennial frequency to support future five year reviews because groundwater pathways to human receptors are rendered incomplete by LUCs.
- The NAS Key West Partnering Team should develop timelines for implementing these recommendations.

2.5.8 Protectiveness Statement

The remedy is protective of human health and the environment.

2.5.9 Supplemental Information

The DD did not identify groundwater COCs or ECCs (TtNUS, 2000b); however, the APM program requires collection of groundwater samples at IR 8 per the PMP (TtNUS, 2000c), PMP Addendum (Battelle, 2012a) and the Sampling and Analysis Plan Addendum 1 (Battelle, 2012b). Two monitoring wells (I8MW8-01 and I8MW8-02) at IR 8 (Figure 2-10) were sampled in December 2013 for metals.

Groundwater samples were analyzed for a reduced list of TAL metals, as well as tin. Selected historical groundwater metals concentrations are illustrated in Figure 2-10. Five of the 11 TAL metals were detected; no metals exceeded their respective groundwater action level in 2013 (Figure 2-10 and Appendix A Table 33). Two metals (manganese and tin) were detected above their respective surface water action levels (Figure 2-10).

It should be noted that the project action levels are based in part on primary drinking water MCLs. FAC Chapter 62-777 provides for a CTL equal to 10 times the primary standard for “poor quality” groundwater. The groundwater at IR 8 should qualify as non-potable GIII groundwater under FAC Chapter 62-520 owing to its high salinity. Since the groundwater is non-potable, it should also qualify for the “poor quality” CTL category under FAC 62-777. This interpretation would enable the application of less stringent CTLs for certain groundwater analytes. Appendix B presents a comparison of 2014 groundwater CTLs with the project action levels.

Only two monitoring wells are currently monitored, and both are within the landfill limits. It is not clear whether sufficient groundwater characterization has occurred to fully delineate groundwater pathways. This potential concern is mitigated by the fact that no potential groundwater pathways appear to be complete. LUCs prevent exposure to human receptors, and the baseline ERA concluded that risk to ecological receptors was negligible.

2.5.10 Next Review

The next five-year review for IR 8 is required to be completed and signed five years following the signature date of this report.

2.6 IR 21 – TRUMAN ANNEX SEMINOLE BATTERY

This section describes the five-year review for IR 21, the Truman Annex Seminole Battery.

2.6.1 History and Site Chronology

A list of important IR 21 historical events and relevant dates in the site chronology is shown below. The identified events are intended to be illustrative, rather than comprehensive.

Date	Event or Activity
Early 1860s	Seminole Battery constructed
1940s to 1950s	Area adjacent to Battery used for fueling and grease rack
1950s	Modern battery additions made
August 1995	Underground Storage Tank (UST) removal by Omega Environmental Services, Inc. (OES)
February 1999	Site Inspection Report for Nine Base Realignment and Closure (BRAC) Parcels issued by TtNUS
September 1999	Supplemental Site Inspection Report issued by TtNUS
March 1999	IRA excavation completed by BEI
September 2000	DD for IR 21 issued by TtNUS
December 2004	First five-year review conducted by TtNUS
July 2010	Second five-year review conducted by TtNUS

2.6.2 Background

2.6.2.1 Site Description

The Truman Annex Seminole Battery was constructed during the Civil War. A modern battery addition was constructed in the 1950s (Figure 2-11). The structure is currently unused and entry is restricted. Little is known about materials used while the Battery was in operation. The oldest portion of the Battery has remnants of a power generator exhaust system (TtNUS, 1999d).

Fueling tanks, known as Tanks 248A and 248B, were located west of the Truman Annex Seminole Battery near Building 248. The tanks were constructed of plate steel and had a capacity of 5,000 gallons each. The tanks were used for gasoline storage and were located under a concrete slab with fuel islands. The fueling island and tanks were removed in August 1995. Soil screening and groundwater samples were analyzed during the closure of the USTs. The UST Closure Report concluded that the tanks were closed in accordance with FDEP guidelines. The area is now covered by grass. The UST Closure Report recommended a study of groundwater in the area (OES, 1995). To the northwest of the former tank location, concrete slabs were present from former grease racks used to lubricate and service vehicles. No stains were visible on or near the slabs (TtNUS, 1999d). These slabs appear to have been removed following the first five-year review (TtNUS, 2010a). The current land surface conditions are shown on Figure 2-11.

2.6.2.2 Summary of Sampling Results

In 1997, TtNUS performed sampling at IR 21 as part of a site inspection. Arsenic, benzo(a)pyrene, and benzo(b)fluoranthene were detected in excess of action levels at one surface soil sample location. Further action was recommended in the Site Inspection Report (TtNUS, 1999d).

Based on the HHRA and ERA, site COCs and ECCs, and their respective media at IR 21 are summarized as follows:

Exposure Medium	COC for Human Health Risk	ECC for Ecological Risk
Soil	benzo(a)pyrene	none
Groundwater	none	none
Surface Water	none	none
Sediment	none	none

2.6.2.3 1999 Interim Remedial Action

In March 1999, BEI completed an IRA at IR 21, excavating 61.5 cubic yards of soil from IR 21 to a depth of 2 feet (BEI, 1999). Confirmation sampling results presented in the Supplemental Site Inspection (SSI) Report revealed that benzo(a)pyrene concentrations remained in excess of its action level at two sidewall sample locations adjacent to the battery foundation. Clean fill was placed in the excavation to reduce the possibility of exposure to potential contaminants remaining below 2 feet (TtNUS, 1999e).

2.6.3 Remedial Actions

2.6.3.1 Remedial Selection

As described in the DD for Seminole Battery (IR 21), LUCs, including institutional and engineering controls, were selected as the remedy for the site since contamination was left in place above concentrations that do not allow for unlimited use and unrestricted exposure (TtNUS, 2000e).

The RAO for IR 21 is not explicitly stated in the DD, but can be reasonably inferred from the results of the baseline HHRA, ERA, and from the risk management decisions described in the DD, as follows:

- Prevent contact between human receptors and site COCs.

2.6.3.2 Remedial Implementation

The selected remedy for IR 21 is LUCs, consisting of institutional and engineering controls. ICs at Truman Annex Seminole Battery include the development of a LUCIP and documentation in the NAS Key West Base Master Plan preventing future residential use at this site. The plan also requires that anyone who disturbs structures identified as permanent cover and/or containment material must comply with appropriate laws and regulations. Furthermore, the LUCIP for IR 21 includes the placement and maintenance of signs around the site perimeter warning against trespassing and disturbing contaminated soil. Personnel from the NAS Key West Public Works Department are required to visually inspect IR 21 at least once every three months to ensure that all LUCS are being implemented and properly maintained. The NAS Key West Public Works Department submits an annual report to FDEP describing the results of the quarterly inspections. LUCs are considered to be protective of human health and the environment under current industrial uses at IR 21, comply with state and federal requirements, and are cost effective (TtNUS, 2000e).

2.6.4 Five-Year Review Process

2.6.4.1 Document Review

Because the selected remedy is LUCs, no sampling has been performed and no documents have been produced since the last five-year review; therefore, a document review for IR 21 is not applicable.

2.6.4.2 Data Review and Evaluation

Because the selected remedy is LUCs, no analytical data have been generated since the 1999 SSI.

2.6.4.3 Site Inspection and Interviews

LUCs are inspected quarterly, and an annual report is prepared and submitted to FDEP. Selected annual LUC compliance reports were reviewed for this five-year review. In addition, a specific site inspection, including interviews, was conducted for the five-year review. Information was recorded on site inspection/interview forms that are presented in Appendix C. No significant issues have been identified. Since access to the site is restricted, trespassing is minimal.

2.6.5 Technical Assessment

The Comprehensive Five-Year Review Guidance (EPA, 2001) states that the technical assessment section should answer three primary questions, each of which is presented below.

2.6.5.1 Question A

Is the remedy functioning as intended by the decision documents?

The remedy to protect human health and the environment is functioning as intended. IR 21 is located on an active military base, and access to the base is restricted. NAS Key West personnel perform quarterly visual inspections to ensure adherence to LUCs, and an annual report is submitted to FDEP describing the results of the quarterly inspections. There is no planned change in site usage for the foreseeable future.

2.6.5.2 Question B

Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy selection still valid?

There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. There have been no significant changes to the standardized risk assessment methodology that could affect the protectiveness of the remedy. Florida CTLs have been updated since the time of the DD (TtNUS, 2000e), and these are ARARs for the site. Toxicity data for selected individual contaminants have also been updated; however, these updates likely do not affect the protectiveness of the remedy because LUCs limit exposure to human receptors. The RAOs remain valid.

2.6.5.3 Question C

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

No new human usage of the site has been identified for IR 21. No weather-related events have affected the protectiveness of the remedy. There is no known information that calls into question the protectiveness of the remedy.

2.6.5.4 Technical Assessment Summary

Based on the data reviewed and the site inspections, the remedy is functioning as intended by the DD (TtNUS, 2000e). There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. There is no other information that calls into question the protectiveness of the remedy.

2.6.6 Issues

This five-year review did not identify any issues that could impact the remedy.

2.6.7 Recommendations and Follow-up Actions

LUCs should remain in place at the site. There are no other applicable recommendations or follow-up actions for IR 21.

2.6.8 Protectiveness Statement

The remedy is protective of human health and the environment.

2.6.9 Next Review

The next five-year review for IR 21 is required to be completed and signed five years following the signature date of this report.

Figure 2-1. AOC B Site Map

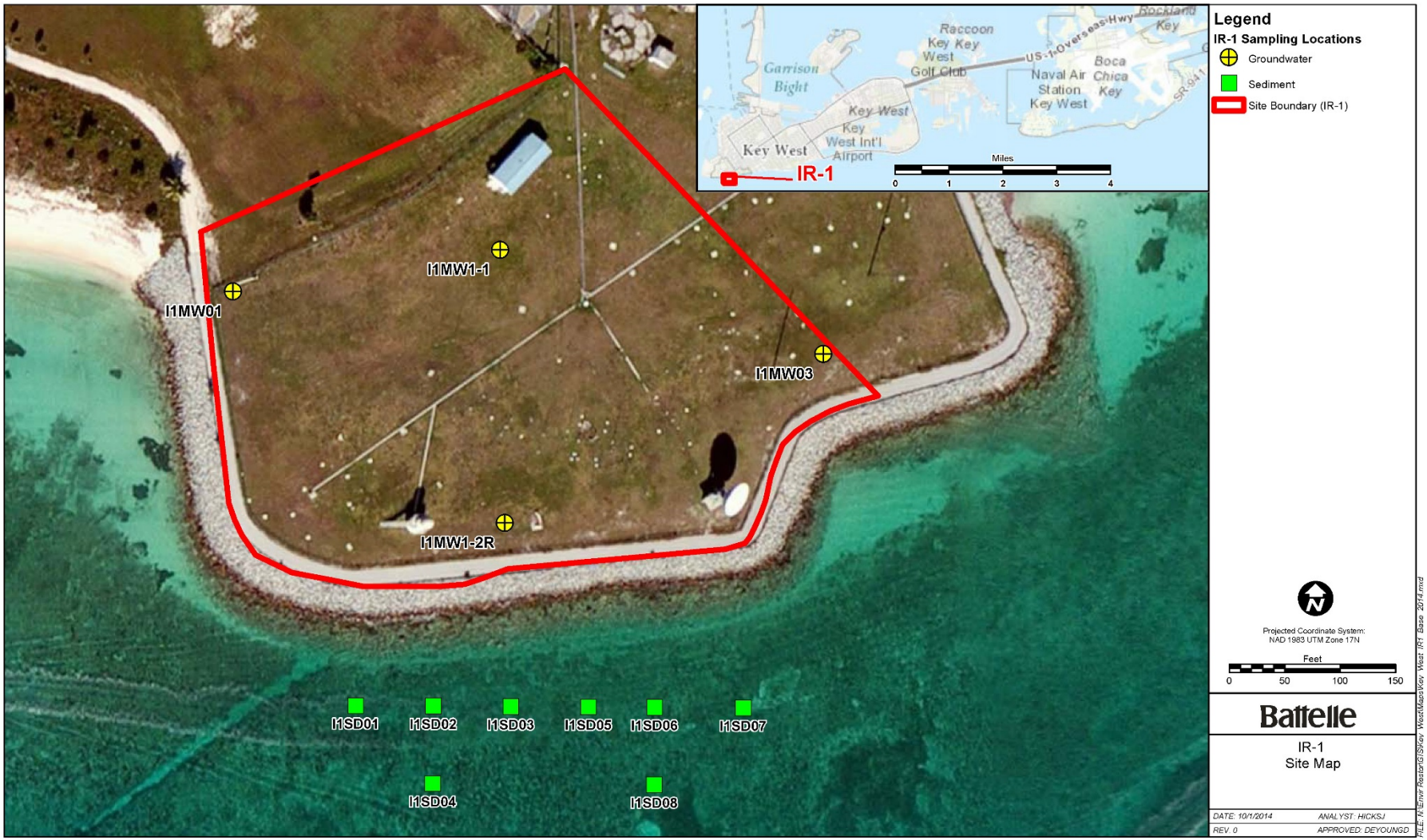
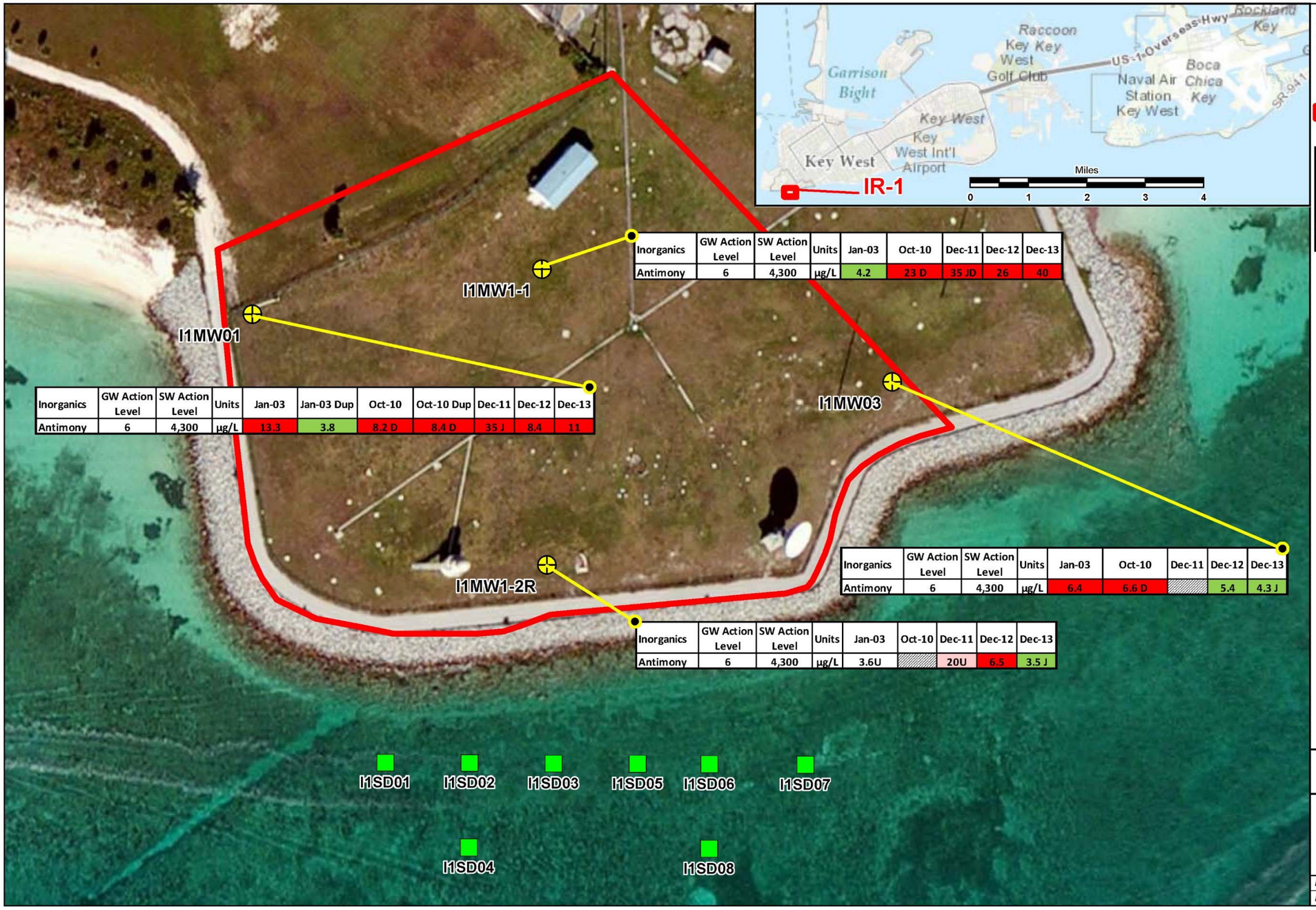


Figure 2-2. IR 1 Site Map



Inorganics	GW Action Level	SW Action Level	Units	Jan-03	Jan-03 Dup	Oct-10	Oct-10 Dup	Dec-11	Dec-12	Dec-13
Antimony	6	4,300	µg/L	13.3	3.8	8.2 D	8.4 D	35 J	8.4	11

Inorganics	GW Action Level	SW Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
Antimony	6	4,300	µg/L	4.2	23 D	35 JD	26	40

Inorganics	GW Action Level	SW Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
Antimony	6	4,300	µg/L	6.4	6.6 D		5.4	4.3 J

Inorganics	GW Action Level	SW Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
Antimony	6	4,300	µg/L	3.6U		20U	6.5	3.5 J

Legend

IR-1 Sampling Locations

- Groundwater
- Sediment
- Site Boundary (IR-1)

Notes:
GW: Groundwater
SW: Surface Water
Detected below Action level
Reporting limit above Action level
Detected above Groundwater Action level
No Available Data

Projected Coordinate System:
NAD 1983 UTM Zone 17N

Feet
0 50 100 150

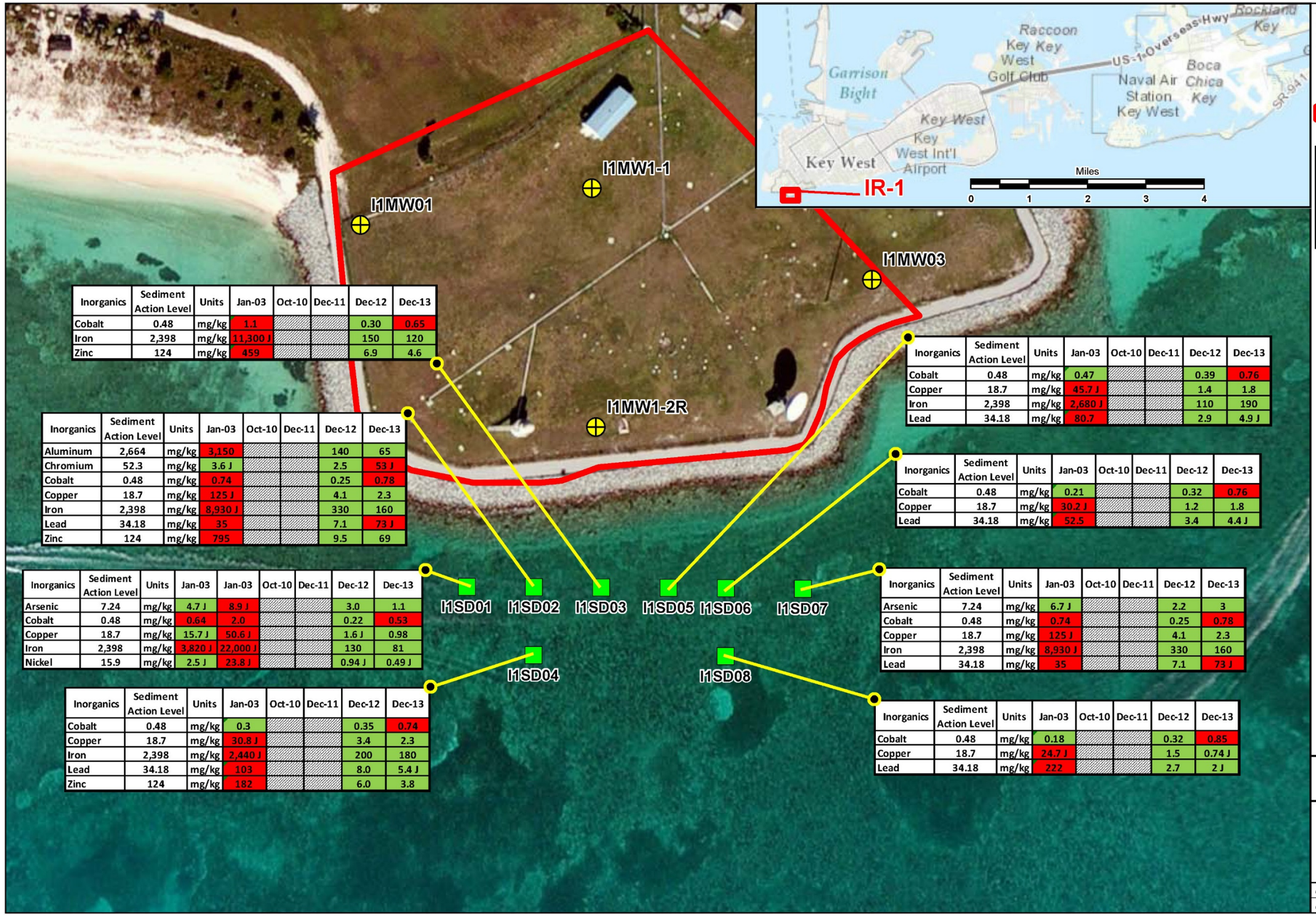
Battelle

IR-1
Inorganics Exceeding
Action Levels (Groundwater)

DATE: 10/1/2014 ANALYST: HICKSJ
REV. 0 APPROVED: DEYOUNGD

FILE: N:\Envir Restor\GIS\Key West\MapsKey West IR1 Base 2014 GW Metals.mxd

Figure 2-3. IR 1 2012 Groundwater Analyte Concentrations Exceeding Action Levels



Inorganics	Sediment Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
Cobalt	0.48	mg/kg	1.1			0.30	0.65
Iron	2,398	mg/kg	11,300 J			150	120
Zinc	124	mg/kg	459			6.9	4.6

Inorganics	Sediment Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
Cobalt	0.48	mg/kg	0.47			0.39	0.76
Copper	18.7	mg/kg	45.7 J			1.4	1.8
Iron	2,398	mg/kg	2,680 J			110	190
Lead	34.18	mg/kg	80.7			2.9	4.9 J

Inorganics	Sediment Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
Aluminum	2,664	mg/kg	3,150			140	65
Chromium	52.3	mg/kg	3.6 J			2.5	53 J
Cobalt	0.48	mg/kg	0.74			0.25	0.78
Copper	18.7	mg/kg	125 J			4.1	2.3
Iron	2,398	mg/kg	8,930 J			330	160
Lead	34.18	mg/kg	35			7.1	73 J
Zinc	124	mg/kg	795			9.5	69

Inorganics	Sediment Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
Cobalt	0.48	mg/kg	0.21			0.32	0.76
Copper	18.7	mg/kg	30.2 J			1.2	1.8
Lead	34.18	mg/kg	52.5			3.4	4.4 J

Inorganics	Sediment Action Level	Units	Jan-03	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
Arsenic	7.24	mg/kg	4.7 J	8.9 J			3.0	1.1
Cobalt	0.48	mg/kg	0.64	2.0			0.22	0.53
Copper	18.7	mg/kg	15.7 J	50.6 J			1.6 J	0.98
Iron	2,398	mg/kg	3,820 J	22,000 J			130	81
Nickel	15.9	mg/kg	2.5 J	23.8 J			0.94 J	0.49 J

Inorganics	Sediment Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
Arsenic	7.24	mg/kg	6.7 J			2.2	3
Cobalt	0.48	mg/kg	0.74			0.25	0.78
Copper	18.7	mg/kg	125 J			4.1	2.3
Iron	2,398	mg/kg	8,930 J			330	160
Lead	34.18	mg/kg	35			7.1	73 J

Inorganics	Sediment Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
Cobalt	0.48	mg/kg	0.3			0.35	0.74
Copper	18.7	mg/kg	30.8 J			3.4	2.3
Iron	2,398	mg/kg	2,440 J			200	180
Lead	34.18	mg/kg	103			8.0	5.4 J
Zinc	124	mg/kg	182			6.0	3.8

Inorganics	Sediment Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
Cobalt	0.48	mg/kg	0.18			0.32	0.85
Copper	18.7	mg/kg	24.7 J			1.5	0.74 J
Lead	34.18	mg/kg	222			2.7	2 J

Legend

IR-1 Sampling Locations

- Groundwater
- Sediment
- Site Boundary (IR-1)

Notes:

- Not a Target Analyte List (TAL) Metal
- Detected below Action level
- Reporting limit above Action level
- Detected above Action level
- No Available Data

Projected Coordinate System:
NAD 1983 UTM Zone 17N

Feet
0 50 100 150

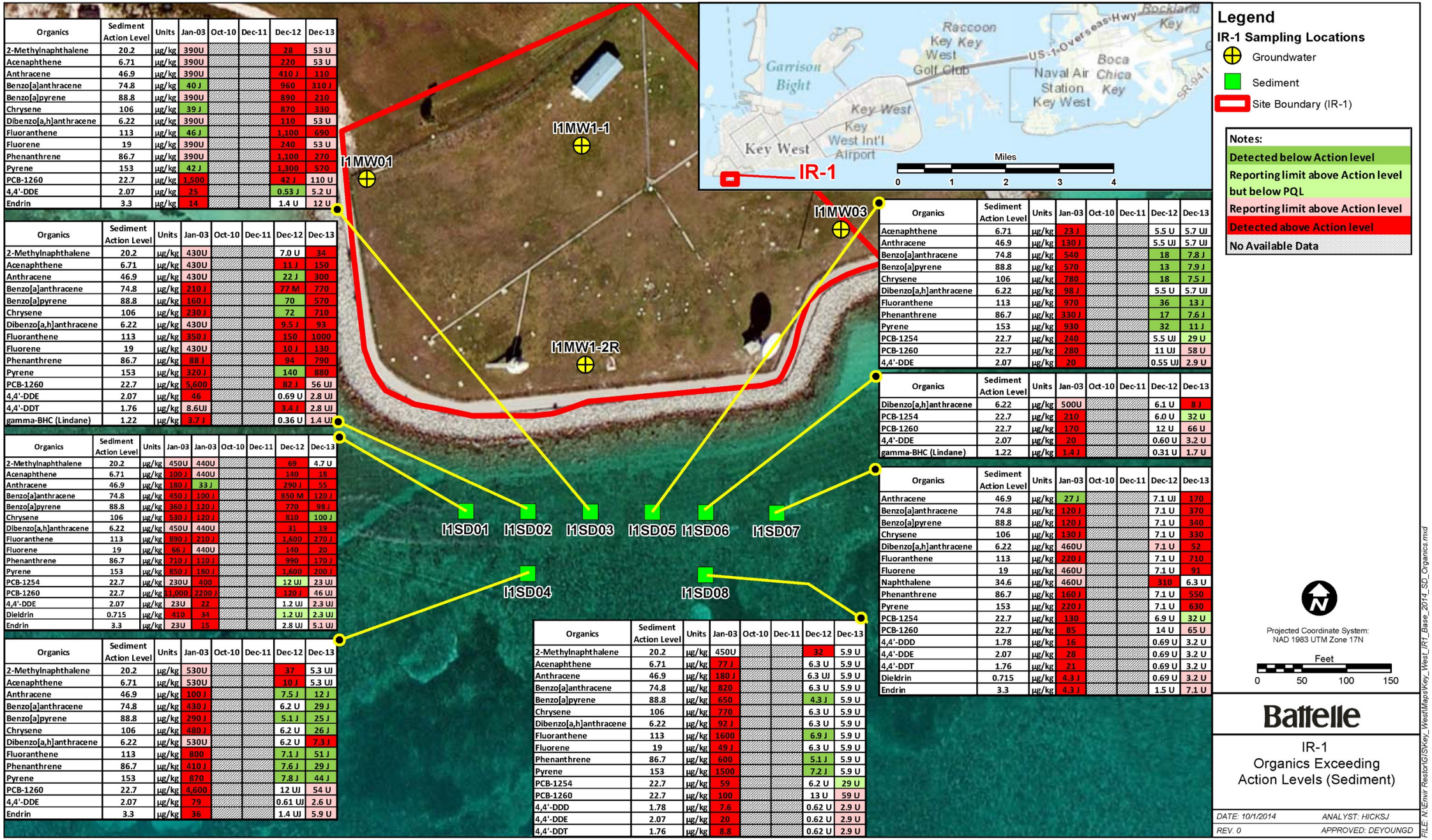
Battelle

IR-1
Inorganics Exceeding
Action Levels (Sediment)

DATE: 10/1/2014 ANALYST: HICKSJ
REV. 0 APPROVED: DEYOUNGD

FILE: N:\Envir Restor\GIS\Key_West\Maps\Key_West_IR1_Base_2014_SD_Metals.mxd

Figure 2-4. IR 1 Historical Sediment Metal Analyte Concentrations Exceeding Action Levels



Organics	Sediment Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
2-Methylnaphthalene	20.2	µg/kg	390U			28	53 U
Acenaphthene	6.71	µg/kg	390U			220	53 U
Anthracene	46.9	µg/kg	390U			410 J	110
Benzo[a]anthracene	74.8	µg/kg	40 J			960	310 J
Benzo[a]pyrene	88.8	µg/kg	390U			890	210
Chrysene	106	µg/kg	39 J			870	330
Dibenzo[a,h]anthracene	6.22	µg/kg	390U			110	53 U
Fluoranthene	113	µg/kg	46 J			1,100	690
Fluorene	19	µg/kg	390U			240	53 U
Phenanthrene	86.7	µg/kg	390U			1,100	270
Pyrene	153	µg/kg	42 J			1,300	570
PCB-1260	22.7	µg/kg	1,500			42 J	110 U
4,4'-DDE	2.07	µg/kg	25			0.53 J	5.2 U
Endrin	3.3	µg/kg	14			1.4 U	12 U

Organics	Sediment Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
2-Methylnaphthalene	20.2	µg/kg	430U			7.0 U	34
Acenaphthene	6.71	µg/kg	430U			11 J	150
Anthracene	46.9	µg/kg	430U			22 J	300
Benzo[a]anthracene	74.8	µg/kg	210 J			77 M	770
Benzo[a]pyrene	88.8	µg/kg	160 J			70	570
Chrysene	106	µg/kg	230 J			72	710
Dibenzo[a,h]anthracene	6.22	µg/kg	430U			9.5 J	93
Fluoranthene	113	µg/kg	350 J			150	1000
Fluorene	19	µg/kg	430U			10 J	130
Phenanthrene	86.7	µg/kg	88 J			94	790
Pyrene	153	µg/kg	320 J			140	880
PCB-1260	22.7	µg/kg	5,600			82 J	56 UJ
4,4'-DDE	2.07	µg/kg	46			0.69 U	2.8 UJ
4,4'-DDT	1.76	µg/kg	8.6UJ			3.4 J	2.8 UJ
gamma-BHC (Lindane)	1.22	µg/kg	3.7 J			0.36 U	1.4 UJ

Organics	Sediment Action Level	Units	Jan-03	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
2-Methylnaphthalene	20.2	µg/kg	450U	440U			69	4.7 U
Acenaphthene	6.71	µg/kg	100 J	440U			140	18
Anthracene	46.9	µg/kg	180 J	33 J			290 J	55
Benzo[a]anthracene	74.8	µg/kg	450 J	100 J			850 M	120 J
Benzo[a]pyrene	88.8	µg/kg	360 J	120 J			770	98 J
Chrysene	106	µg/kg	530 J	120 J			810	100 J
Dibenzo[a,h]anthracene	6.22	µg/kg	450U	440U			31	19
Fluoranthene	113	µg/kg	890 J	210 J			1,600	270 J
Fluorene	19	µg/kg	66 J	440U			140	20
Phenanthrene	86.7	µg/kg	710 J	110 J			990	170 J
Pyrene	153	µg/kg	850 J	180 J			1,600	200 J
PCB-1254	22.7	µg/kg	230U	400			12 UJ	23 UJ
PCB-1260	22.7	µg/kg	11,000	2200 J			120 J	46 UJ
4,4'-DDE	2.07	µg/kg	23U	22			1.2 UJ	2.3 UJ
Dieldrin	0.715	µg/kg	410	34			1.2 UJ	2.3 UJ
Endrin	3.3	µg/kg	23U	15			2.8 UJ	5.1 UJ

Organics	Sediment Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
2-Methylnaphthalene	20.2	µg/kg	530U			37	5.3 U
Acenaphthene	6.71	µg/kg	530U			10 J	5.3 UJ
Anthracene	46.9	µg/kg	100 J			7.5 J	12 J
Benzo[a]anthracene	74.8	µg/kg	430 J			6.2 U	29 J
Benzo[a]pyrene	88.8	µg/kg	290 J			5.1 J	25 J
Chrysene	106	µg/kg	480 J			6.2 U	26 J
Dibenzo[a,h]anthracene	6.22	µg/kg	530U			6.2 U	7.3 J
Fluoranthene	113	µg/kg	800			7.1 J	51 J
Phenanthrene	86.7	µg/kg	410 J			7.6 J	29 J
Pyrene	153	µg/kg	870			7.8 J	44 J
PCB-1260	22.7	µg/kg	4,600			12 UJ	54 U
4,4'-DDE	2.07	µg/kg	79			0.61 UJ	2.6 U
Endrin	3.3	µg/kg	36			1.4 UJ	5.9 U

Organics	Sediment Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
2-Methylnaphthalene	20.2	µg/kg	450U			32	5.9 U
Acenaphthene	6.71	µg/kg	77 J			6.3 U	5.9 U
Anthracene	46.9	µg/kg	180 J			6.3 UJ	5.9 U
Benzo[a]anthracene	74.8	µg/kg	820			6.3 U	5.9 U
Benzo[a]pyrene	88.8	µg/kg	650			4.3 J	5.9 U
Chrysene	106	µg/kg	770			6.3 U	5.9 U
Dibenzo[a,h]anthracene	6.22	µg/kg	92 J			6.3 U	5.9 U
Fluoranthene	113	µg/kg	1600			6.9 J	5.9 U
Fluorene	19	µg/kg	49 J			6.3 U	5.9 U
Phenanthrene	86.7	µg/kg	600			5.1 J	5.9 U
Pyrene	153	µg/kg	1500			7.2 J	5.9 U
PCB-1254	22.7	µg/kg	59			6.2 U	29 U
PCB-1260	22.7	µg/kg	100			13 U	59 U
4,4'-DDD	1.78	µg/kg	7.6			0.62 U	2.9 U
4,4'-DDE	2.07	µg/kg	20			0.62 U	2.9 U
4,4'-DDT	1.76	µg/kg	8.8			0.62 U	2.9 U

Organics	Sediment Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
Acenaphthene	6.71	µg/kg	23 J			5.5 U	5.7 UJ
Anthracene	46.9	µg/kg	130 J			5.5 UJ	5.7 UJ
Benzo[a]anthracene	74.8	µg/kg	540			18	7.8 J
Benzo[a]pyrene	88.8	µg/kg	570			13	7.9 J
Chrysene	106	µg/kg	780			18	7.5 J
Dibenzo[a,h]anthracene	6.22	µg/kg	98 J			5.5 U	5.7 UJ
Fluoranthene	113	µg/kg	970			36	13 J
Phenanthrene	86.7	µg/kg	330 J			17	7.6 J
Pyrene	153	µg/kg	930			32	11 J
PCB-1254	22.7	µg/kg	240			5.5 UJ	29 U
PCB-1260	22.7	µg/kg	280			11 UJ	58 U
4,4'-DDE	2.07	µg/kg	20			0.55 UJ	2.9 U

Organics	Sediment Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
Dibenzo[a,h]anthracene	6.22	µg/kg	500U			6.1 U	8 J
PCB-1254	22.7	µg/kg	210			6.0 U	32 U
PCB-1260	22.7	µg/kg	170			12 U	66 U
4,4'-DDE	2.07	µg/kg	20			0.60 U	3.2 U
gamma-BHC (Lindane)	1.22	µg/kg	1.4 J			0.31 U	1.7 U

Organics	Sediment Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
Anthracene	46.9	µg/kg	27 J			7.1 UJ	170
Benzo[a]anthracene	74.8	µg/kg	120 J			7.1 U	370
Benzo[a]pyrene	88.8	µg/kg	120 J			7.1 U	340
Chrysene	106	µg/kg	130 J			7.1 U	330
Dibenzo[a,h]anthracene	6.22	µg/kg	460U			7.1 U	52
Fluoranthene	113	µg/kg	220 J			7.1 U	710
Fluorene	19	µg/kg	460U			7.1 U	91
Naphthalene	34.6	µg/kg	460U			310	6.3 U
Phenanthrene	86.7	µg/kg	160 J			7.1 U	550
Pyrene	153	µg/kg	220 J			7.1 U	630
PCB-1254	22.7	µg/kg	130			6.9 U	32 U
PCB-1260	22.7	µg/kg	85			14 U	65 U
4,4'-DDD	1.78	µg/kg	16			0.69 U	3.2 U
4,4'-DDE	2.07	µg/kg	28			0.69 U	3.2 U
4,4'-DDT	1.76	µg/kg	21			0.69 U	3.2 U
Dieldrin	0.715	µg/kg	4.3 J			0.69 U	3.2 U
Endrin	3.3	µg/kg	4.3 J			1.5 U	7.1 U

Legend

IR-1 Sampling Locations

- Groundwater
- Sediment
- Site Boundary (IR-1)

Notes:
Detected below Action level
Reporting limit above Action level but below PQL
Reporting limit above Action level
Detected above Action level
No Available Data

Projected Coordinate System:
NAD 1983 UTM Zone 17N

Feet
0 50 100 150

Battelle

IR-1
Organics Exceeding
Action Levels (Sediment)

DATE: 10/1/2014 ANALYST: HICKSJ
REV. 0 APPROVED: DEYOUNGD

FILE: N:\Envir Restor\GIS\Key_West\MapsKey_West_IR1_Base_2014_SD_Organics.mxd

Figure 2-5. IR 1 Historical Sediment Organic Analyte Concentrations Exceeding Action Levels

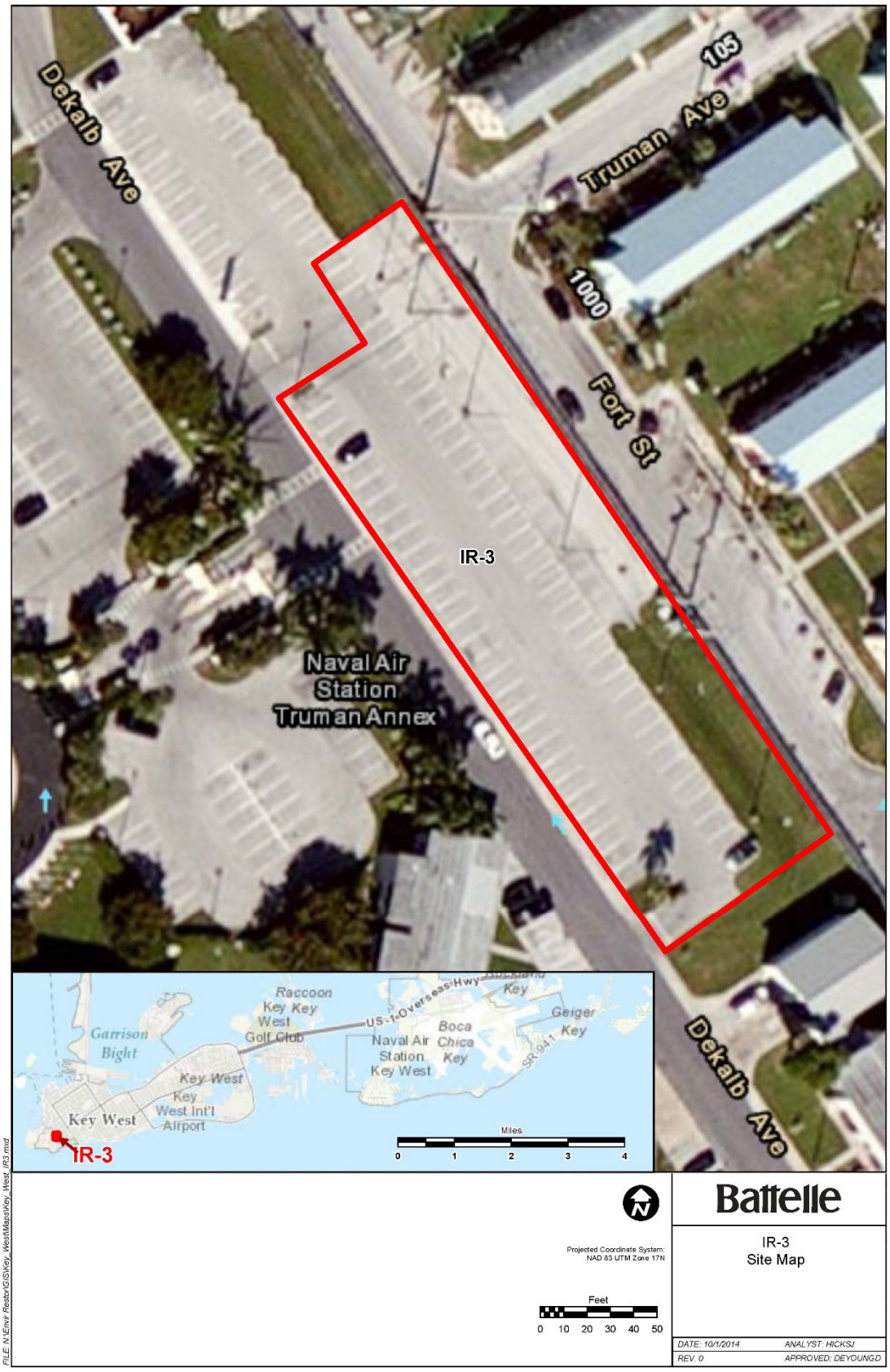


Figure 2-6. IR 3 Site Map

Figure 2-7. IR 7 Site Map

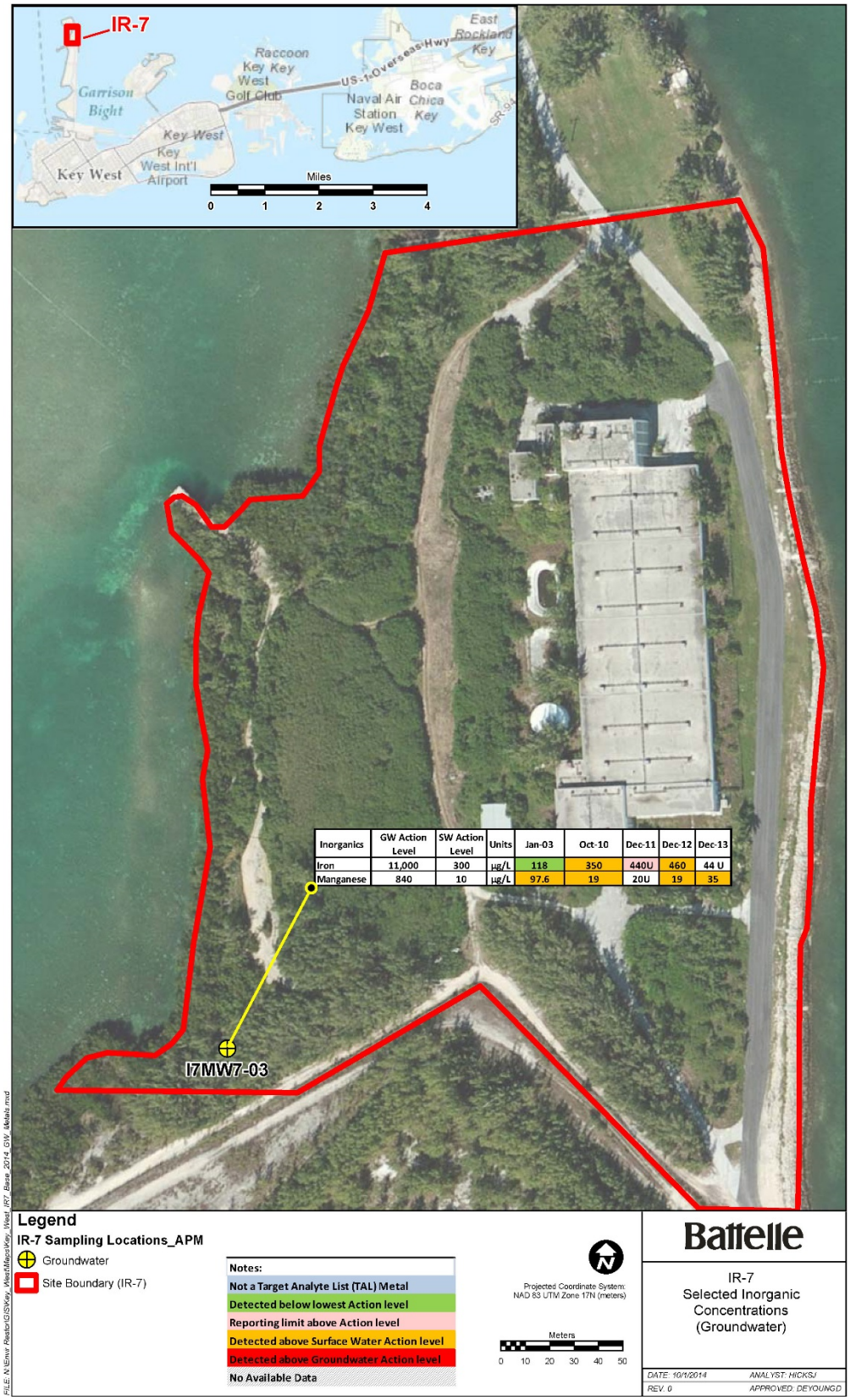


Figure 2-8. IR 7 Selected Groundwater Metal Concentrations

Figure 2-9. IR 8 Site Map

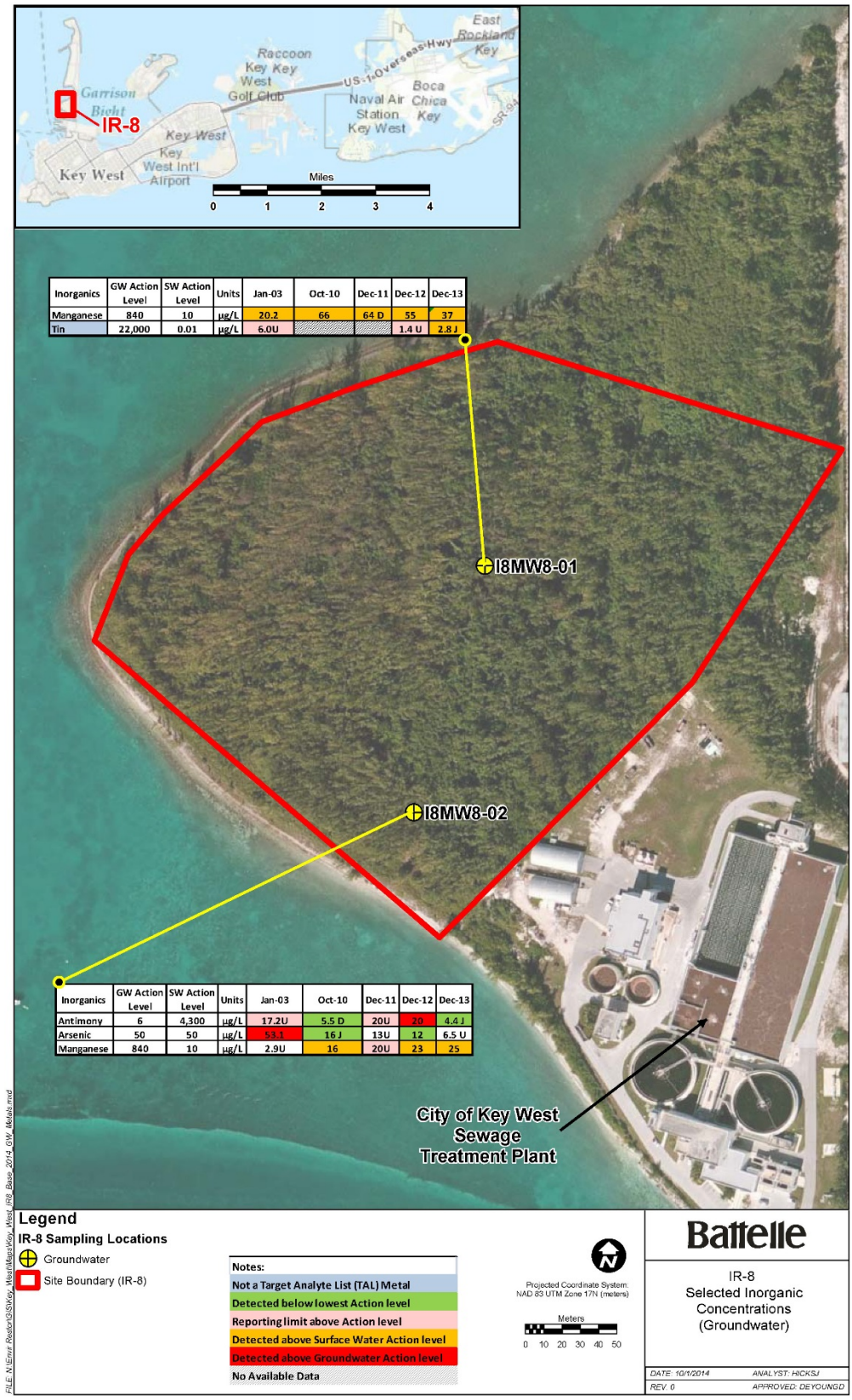


Figure 2-10. IR 8 Selected Groundwater Metal Concentrations

Figure 2-11. IR 21 Site Map

3.0 RCRA SITES

The following six NAS Key West sites are regulated under RCRA: SWMU 1, SWMU 2, SWMU 3, SWMU 5, SWMU 7, and SWMU 9. Five-year reviews are not a requirement under RCRA, but the NAS Key West Partnering Team decided to perform corrective action effectiveness evaluations to meet requirements of the SOB and to demonstrate the Station's commitment to environmental stewardship. For efficiency, the corrective action effectiveness evaluations for SWMUs 1, 2, 3, 5, 7, and 9 are combined with the five-year reviews for the CERCLA sites (see Section 2) and follow the format of a CERCLA five-year review.

The first corrective action effectiveness evaluations for SWMUs 1, 2, 3, 5, 7, and 9 were prepared in 2004, an action triggered by the Hazardous and Solid Waste Amendments (HSWA) permit modification for SWMUs 1 through 4, which took effect on May 3, 1999. The previous five-year review (TtNUS, 2010a) included seven SWMUs. SWMU 4, the Boca Chica Aircraft Intermediate Maintenance Department (AIMD) Building A-990, achieved NFA status in 2008 and was therefore not reviewed in the previous five-year review, and is not reviewed in this document.

Sections 3.1 through 3.6 contain the corrective action effectiveness evaluations for SWMUs 1, 2, 3, 5, 7, and 9, respectively

3.1 SWMU 1- BOCA CHICA OPEN DISPOSAL AREA

This section describes the corrective action effectiveness evaluation for SWMU 1, the Boca Chica Open Disposal Area.

3.1.1 History and Site Chronology

A list of important SWMU 1 historical events and relevant dates in the site chronology is shown below.

Date	Event or Activity
1942 to mid-1960s	Site operations
before 1985	Three aboveground storage tanks (ASTs) removed (portion of one remained until 2002)
May 1985	IAS Report issued by Envirodyne Engineers, Inc.
March 1987	Verification Study Assessment issued by G&M
April 1988	VSI conducted by EPA as documented in the RFA Report
January 1991	Preliminary RI Report issued by IT
June 1994	RFI/RI Report issued by IT
November 1995	Delineation Sampling Report produced by BEI
April 1996	IRA excavation completed by BEI
July 1997	Supplemental RFI/RI report for high-priority sites issued by B&RE
March 1998	CMS Report for SWMU 1 issued by B&RE
July 1998	SOB issued by TtNUS
April 2000	First year of quarterly performance monitoring implemented by TtNUS
March 2001	Delineation sampling completed by CH2MHill Constructors, Inc. (CCI)
January 2002	APM conducted by TtNUS
March 2003	Excavation of petroleum contaminated soil completed by CCI
January 2003	APM conducted by TtNUS
July 2003	RCRA Corrective Action Management Plan (CAMP), Rev. 4 issued by TtNUS
January 2004	APM conducted by REA Remedial Solutions, Inc.

Date	Event or Activity
December 2004	First five-year review conducted by TtNUS
February 2005	APM conducted by REA Remedial Solutions, Inc.
February 2006	APM conducted by REA Remedial Solutions, Inc.
January 2007	APM conducted by REA Remedial Solutions, Inc.
January 2008	APM conducted by REA Remedial Solutions, Inc.
January 2009	APM conducted by OHC Environmental Engineering
April 2010	APM conducted by OHC Environmental Engineering *
July 2010	Second five-year review conducted by TtNUS
December 2011	APM conducted by ECS*
December 2012	APM conducted by ECS*
December 2013	APM conducted by Battelle*
December 2014	APM conducted by Battelle

*Represents sample data covered by this corrective action effectiveness evaluation.

3.1.2 Background

3.1.2.1 Site Description

SWMU 1, the Boca Chica Open Disposal Area, is located in the southeastern portion of Boca Chica Key, between Stone Road and the mangrove swamp along Geiger Creek and the Atlantic Ocean (Figure 3-1). Boca Chica Key is the location of an active military airstrip and support facilities. SWMU 1 was the location of an open disposal and burning area for general refuse and waste associated with aircraft maintenance activities from 1942 to the mid-1960s. The site received general refuse and waste associated with the operation and maintenance of aircraft operated by the squadrons and AIMD.

An estimated 2,600 tons of waste was disposed or burned at this site each year (G&M, 1987). It is estimated that these wastes included 60,000 tons of general refuse; 50,000 gallons of waste oils and fuels; 40,000 gallons of solvents (including methyl ethyl ketone, toluene, and xylene); 1,000 gallons of waste paints; and 3,000 gallons of waste paint thinners.

The area of waste disposal and burning (approximately 4 acres) was indicated by debris present near the eastern edge of the site. Most of the debris area lies beneath a dense canopy of mangrove trees. The mangrove-covered area is protected by state and federal dredge and fill regulations, since it is classified as a wetland (IT, 1994).

3.1.2.2 Summary of Sampling Results

Sampling at SWMU 1 was conducted to characterize contamination. Sampling was performed in 1986, 1990, 1993, 1995, and 1996 during a series of field investigations. Metals, SVOCs, and pesticides were found in the soil and sediment in excess of the action levels derived from the most restrictive ARARs and screening action levels (SALs). The metals found in soil included lead, chromium, copper, manganese, and mercury. PAHs, which are common constituents and byproducts of asphalt, vehicle exhaust, and burning, were found in excess of action levels in the initial investigations. In addition, the pesticide 4,4'-DDT, and its close structural analogs 4,4'-DDD and 4,4'-DDE, were detected in soil and sediment. For convenience, 4,4'-DDT, 4,4'-DDD, and 4,4'-DDE will be referred to as DDT, DDD, and DDE, respectively.

3.1.2.3 1996 Interim Remedial Action

Based on delineation sampling results, the Navy coordinated with EPA and FDEP during discussions held on October 24-30, 1995, to determine the boundaries for excavating contaminated soil and sediment in an IRA. The estimated quantity of soil to be removed was increased from the budgeted 2,500 cubic yards to 5,740 cubic yards (BEI, 1995a) based on sampling results and discussions with the regulatory agencies. Under the Navy's Remedial Action Contract (RAC), BEI completed the contaminated soil and sediment IRA in April 1996. The actual quantity of soil removed was 5,916 cubic yards. Approximately 71 tons of soil and sediment were excavated and treated/disposed offsite as hazardous waste based on lead concentrations. Approximately 7,400 tons of contaminated soil and sediment were excavated and disposed offsite as non-hazardous waste. Approximately 5,800 tons of clean backfill were placed in the excavation. Pursuant to the wetlands permit requirement, BEI backfilled the material at SWMU 1 at a slope to promote natural mangrove re-vegetation in the excavated area (BEI, 1998).

3.1.2.4 Summary of Risk

An HHRA and ERA were performed as part of the Supplemental RFI/RI (B&RE, 1997). The HHRA identified a carcinogenic (i.e., cancer) risk for the hypothetical future resident from Aroclor 1260 in surface soil, and benzo(a)pyrene and arsenic in surface soil and sediment. Benzo(a)pyrene was the principal COC contributing to the cancer risk. The HHRA identified a non-carcinogenic risk for the hypothetical future resident from metals, primarily iron and manganese in surface soil.

The ERA (B&RE, 1997) concluded that ecological risks were marginal, but metals, PAHs, and DDT and its metabolites might pose risks to some receptors.

Based on the HHRA and ERA, site COCs and ECCs, and their respective media at SWMU 1 are summarized as follows:

Exposure Medium	COC for Human Health Risk	ECC for Ecological Risk
Soil	Inorganics: arsenic, beryllium, cadmium, chromium, copper, iron, lead, manganese, mercury SVOCs: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene Pesticides/PCBs: 4,4'-DDD, 4,4'-DDE, 4,4'DDT, Aroclor 1260	Inorganics: aluminum, antimony, beryllium, chromium, copper, manganese, mercury, tin, zinc SVOCs: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, hexachlorophene, indeno(1,2,3-cd)pyrene, phenanthrene, pyrene Pesticides/PCBs: 4,4'-DDD, 4,4'-DDE, 4,4'DDT, Aroclor 1260
Groundwater	none	Inorganics: beryllium, cadmium, copper, manganese, mercury, tin, vanadium SVOCs: pyrene

Surface Water	Inorganics: beryllium, cadmium, copper, manganese, mercury	none
Sediment	Inorganics: arsenic, lead SVOCs: benzo(a)pyrene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene	Inorganics: selenium, tin, vanadium Pesticides: 4,4'-DDD, 4,4'-DDE, 4,4'-DDT SVOCs: benzo(a)pyrene, benzo(g,h,i)perylene, chrysene, hexachlorophene, pyrene
Biota (fish tissue)	none	lead

3.1.3 Remedial Actions

3.1.3.1 Remedy Selection

The CMS determined that the appropriate remedy for SWMU 1 was ICs, consisting of LUCs with monitoring (B&RE, 1998b). The LUCs are designed to eliminate or reduce exposure pathways by limiting site access. Additional information regarding the selection of LUCs with monitoring as a remedy for SWMU 1 is provided in the CMS and summarized in the SOB for SWMU 1 (TtNUS, 1998d).

The RAOs for SWMU 1 are not explicitly stated in the SOB, but can be reasonably inferred from the results of the baseline HHRA, ERA, and the CMS, as follows:

- Prevent human and ecological receptors from contacting contaminants in soil, sediment, and surface water at concentrations which would result in adverse effects.
- Monitor potential human exposure to groundwater having contaminants at concentration levels greater than State and Federal MCLs in the residential well.
- Ensure the migration of contaminants from soil and sediment to the surficial aquifers do not have adverse effects on human health and the environment.
- Compliance at SWMU 1 with contaminant-specific, location-specific, and action-specific Federal and State ARARs.

3.1.3.2 Remedy Implementation

3.1.3.2.1 Land-Use Controls with Monitoring

SWMU 1 is near an active air strip on an active military base with no planned change in site usage for the foreseeable future. The IRA conducted in spring 1996 removed the majority of the contaminated soil and sediment. Other alternatives considered would have required the destruction of significant areas of uncontaminated mangrove swamp to gain access to the remaining contaminated soil and sediment.

Additionally, considering that the IRA was conducted at a significant cost to remove the majority of the contamination, the costs associated with other alternatives were considered by the NAS Key West Partnering Team to be cost prohibitive when compared to the potential benefits to human health and the environment to be gained (B&RE, 1998b).

LUCs were developed by the NAS Key West Partnering Team and implemented through LUCIPs. These controls were designed to ensure protection of human health and the environment by

restricting future site use and accessibility, educating NAS personnel, and maintaining records of contamination. The LUCs documented in the NAS Key West Base Master Plan prevent future residential use at this site. The LUCIP for SWMU 1 includes the placement and maintenance of signs around the site perimeter, which state that trespassing and dumping are not permitted at the site.

Personnel from the NAS Key West Public Works Department are required to visually inspect SWMU 1 at least once every three months to ensure that all LUCs are being implemented and properly maintained. The NAS Key West Public Works Department submits an annual report to FDEP describing the results of the quarterly inspections.

The SOB prescribed that groundwater, surface water, and sediment samples to be collected quarterly for the first year and annually thereafter for nine years to evaluate the effectiveness of the IRA and determine if additional remedial action is warranted. The quarterly monitoring began in April 2000 and was completed in January 2001 (TtNUS, 2001a). Subsequently, groundwater, surface water, and sediment samples were collected annually from 2002 through the present. Monitoring of ecological receptors (tissue) was performed in October 2000 and January 2003, and involved the analysis of fish, crab, and vegetation tissue for pesticides and metals (TtNUS, 2001b; 2003a).

The first five-year review (TtNUS 2004) recommended that biomonitoring be discontinued because metals, DDD, and DDE were expected to remain in SWMU 1 media for the foreseeable future, and since existing tissue data showed negligible risk to ecological receptors. The first five-year review also noted that tissue monitoring could be re-established if concentrations of COCs in abiotic media substantially increase.

In November 2006, a storm surge investigation was initiated to determine if the storm surge from Hurricane Wilma in October 2005 had caused significant contaminant migration. The purpose of the investigation was to determine if contamination had migrated outside the established site boundary for SWMU 1. Samples were collected in November 2006 and May 2007 and evaluated with results from annual monitoring to assess the effectiveness of the site remedy. The Storm Surge Evaluation Report resulted in expansion of the SWMU 1 site boundary to the north, east, and south (Figure 3-1).

3.1.3.2.2 Additional Remediation

During the first quarterly monitoring event conducted as part of the selected remedy for SWMU 1, TtNUS personnel discovered a free-phase petroleum-based product in one monitoring well at SWMU 1. The monitoring well was located within the previously remediated area. This product resembled the tar-like substance discovered by BEI during the 1996 IRA. In addition, a sheen was observed on surface water near the monitoring well (TtNUS, 2001a).

In response to this discovery, delineation activities were conducted at SWMU 1 to evaluate the vertical and horizontal extent of the material identified during previous sampling activities. Following delineation, removal activities were conducted at SWMU 1 from March to June 2002. A total of 8,450 tons of petroleum-contaminated soil was excavated from the area. The non-hazardous soil was transported to Waste Management's Central Landfill in Pompano Beach,

Florida for disposal. Approximately 500 gallons of free product/contaminated water were recovered by a vacuum truck, transported and disposed at the Cliff Berry, Inc. facility in Fort Lauderdale, Florida. The free product/water was classified as non-hazardous waste using the excavated soil waste profile and analytical results. Backfilling began in June 2002 and was completed in February 2003. Site restoration was completed in March 2003 by placing a layer of clean topsoil (approximately 1 foot deep) over the backfilled source area excavation (CCI, 2003).

Following restoration, Oxygen Release Compound (ORC®), a biodegradation-enhancement reagent, was injected to remediate any residual petroleum contamination. Originally, the method of ORC® placement specified in the work plan was to mix ORC® with clean sand during backfilling of the excavation. Due to the residual petroleum product sinking to the bottom of the excavation and the increased size of the excavation, ORC® was injected into the backfill material in the saturated zone after it was placed. This allowed a more precise placement of the ORC® at the excavation bottom where the potential for petroleum contamination was highest (CCI, 2003). A monitoring well was placed in the center of the remediation area and sampled in August 2003 (TtNUS, 2003b).

3.1.3.2.3 2011-2014 Airfield Restoration Project

An airfield restoration project began construction in October 2011 to restore airfield clear zones and improve the stormwater drainage systems at Boca Chica Field. Activities near SWMU 1 included: 1) re-grading along the eastern boundary of the site to improve storm water drainage; and 2) re-planting of mangrove to promote wetland development. No media (soil, sediment, surface water or groundwater) within the LUC boundary of the site were disturbed.

3.1.3.3 Sampling Events since the Last Five-Year Review

Five annual sampling events involving the monitoring of groundwater, surface water, and sediment have been conducted since the previous five-year review in July 2010; these events were conducted in January 2010 (OHC, 2010), December 2011 (ECS, 2012), December 2012 (ECS, 2013), December 2013 (Battelle, 2015), and December 2014.

3.1.4 Five-Year Review Process

3.1.4.1 Document Review

Reports and data from monitoring and investigations conducted from 2010 through 2013 were reviewed for this corrective action effectiveness evaluation. The most recent available data report reviewed for this corrective action effectiveness evaluation is the 2013 APM Report (Battelle, 2015). Tables 1 through 33 of the 2013 APM Report present information on optimization of monitoring analyte suites as well as compilations of historical data for the APM sites. These tables are included for reference as Appendix A to this report.

The 2012 APM report set forth the decision rules adopted by the NAS Key West Partnering Team in 2012 for optimizing the sampling program. Appendix A, Table 3 contains the APM optimization rules defined by the Partnering Team. Appendix A, Table 4 highlights the APM optimization summary and provides a list of the analytes that qualified to be removed from the APM program based on the decision rules. Partnering Team discussions held in July 2013 further revised the optimization rules such that all landfill sites (i.e., SWMU 1, IR 1, IR 7, and IR 8) will require analysis

of all compounds from their respective SOB and DDs. Reduced analytical suites for these sites will require further consideration by the NAS Key West Partnering Team (Battelle, 2015).

3.1.4.2 Data Review and Evaluation

Surface soil data were summarized and reviewed in the first five-year review (TtNUS, 2004a). Surface soil sampling is not part of the long-term monitoring plan for SWMU 1. Therefore, no new surface soil data have been generated since the last review. Biological tissue data from SWMU 1 were also evaluated in the first five-year review, and that review recommended discontinuing biomonitoring (TtNUS, 2004a). Tissue samples have not been collected in the past five years; therefore, no evaluation of tissue data is included in this report.

The SOB did not identify any groundwater COCs. Groundwater ECCs include inorganic metals (beryllium, cadmium, copper, manganese, mercury, tin, and vanadium) and the SVOC pyrene. All groundwater ECCs were either not detected, or detected below groundwater action levels (Appendix A, Tables 5 and 7). Discussion of non-COC groundwater sampling and analysis is presented in Section 3.1.9.1.

Surface water COCs include the metals beryllium, cadmium, copper, manganese, and mercury; there are no surface water ECCs. With the exception of cadmium and mercury, all surface water COCs were detected above their respective action level in one or more samples in 2013, the most recently reviewed monitoring report. Although surface water COCs have exceeded action levels, LUCs prevent human exposure.

The APM program requires collection of groundwater and surface water samples beyond those prescribed by the CMS and SOB at SWMU 1. The sampling program was established in the PMP (TtNUS, 2000c), PMP Addendum (Battelle, 2012a) and the Sampling and Analysis Plan Addendum 1 (Battelle, 2012b). Discussion of non-COC groundwater and surface water sampling and analysis is presented in Section 3.1.9.

Sediment COCs include inorganic metals (arsenic and lead) and SVOCs (benzo(a)pyrene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene); sediment ECCs include inorganic metals (selenium, tin, and vanadium), pesticides (4,4'-DDD, 4,4'-DDE, 4,4'-DDT), and SVOCs (benzo(a)pyrene, benzo(g,h,i)perylene, chrysene, hexachlorophene, pyrene). There are no sediment ECCs. The APM program also requires collection of sediment samples at SWMU 1. Sediment samples were collected in 2013 from five locations (S1SD01 through S1SD05) at SWMU 1 (Figure 3-1) and analyzed for metals, PAHs, and pesticides.

The COC arsenic exceeded the action level in two samples – S1SD-02 and S1SD-05 (Figure 3-3). Arsenic concentrations show no distinct historical trends at locations S1SD-02 and S1SD-05, but current concentrations are near the sediment action level (Figure 3-3 and Appendix A, Table 12). The COC lead has been detected above action levels at all five sampling locations at least once during the past five years, all sediment locations exhibit lead concentrations lower than historic concentration from 2003. The PAH COCs benzo(a)pyrene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene exceeded sediment action levels in one or more sampling locations during the five year review period, but show no distinct historical concentration trends. Although sediment COCs have exceeded action levels, LUCs prevent human exposure to sediment.

The ECC selenium had one slight exceedance of the sediment action level in one sample in 2012 (S1SD-01); all other samples within the five year review period have either been detected below action levels or not detected. Tin has exceeded action levels in three of five locations in sediment (S1SD-02, S1SD-04, and S1SD-05) and the concentrations remain relatively stable between sampling events (Appendix A, Table 12). Similar to tin, the ECC vanadium has been detected across multiple sample locations and has remained relatively stable between sampling events. The PAH ECCs benzo(a)pyrene, benzo(g,h,i)perylene, chrysene, and pyrene exceeded sediment action levels in one or more sampling locations during the five year review period. However, these exceedances are either consistent with, or below historic detections dating back to the RFI/RI (B&RE, 1997). Discussion of non-COC sediment sampling and analysis is presented in Section 3.1.9.3.

3.1.4.3 Site Inspection and Interviews

LUCs are inspected quarterly, and an annual report is prepared and submitted to FDEP. Selected annual LUC compliance reports were reviewed for this five-year review. In addition, a specific site inspection, including interviews, was conducted for the five-year review. Information was recorded on site inspection/interview forms that are presented in Appendix C. No significant issues have been identified. Since access to the site is restricted, trespassing is minimal. In addition, warning signs are in place around the site perimeter, notifying base personnel SWMU 1 is off limits.

3.1.5 Technical Assessment

The technical assessment is focused on three primary questions, each of which is presented below.

3.1.5.1 Question A

Is the remedy functioning as intended by the decision documents?

The remedy is functioning as intended, to protect human health through LUCs and monitoring of environmental media to document concentration reductions of COCs following the IRA NAS Key West personnel perform quarterly visual inspections to ensure adherence to LUCs, and an annual report is submitted to FDEP describing the results of the quarterly inspections. Annual monitoring of groundwater, surface water, and sediment is conducted and is reported to FDEP. In addition, warning signs are in place around the site perimeter, reducing the likelihood of trespassing and limiting potential exposure to base personnel. There is no planned change in site usage for the foreseeable future.

3.1.5.2 Question B

Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy selection still valid?

There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. There has been no change to the standardized risk assessment methodology that could affect the protectiveness of the remedy. Florida CTLs have been updated since the time of the SOB (TtNUS, 1998d). Toxicity data for selected individual contaminants have

also been updated; however, these updates do not affect the protectiveness of the remedy to human receptors because LUCs prevent exposure.

The ERA documented in the SOB concluded that risk to terrestrial and aquatic receptors is marginal and has been mitigated by the IRA. The ERA concluded that ecological risks would decrease over time. The discontinuation of biomonitoring at the site following the first five year review further supports the ERA conclusion.

The RAOs remain valid.

3.1.5.3 Question C

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

No new information has come to light that could call into question the protectiveness of the remedy.

3.1.5.4 Technical Assessment Summary

Based on the data reviewed and the site inspections, the remedy is functioning as intended by the SOB and HSWA permit. There have been no changes to the standardized risk assessment methodology that could affect the protectiveness of the remedy.

LUCs prevent human contact with contaminated media, therefore all pathways to human receptors are deemed incomplete.

This review did not produce any other information that calls into question the protectiveness of the remedy.

3.1.6 Issues

This five-year review did not identify any issues that could impact the remedy.

3.1.7 Recommendations and Follow-up Actions

The findings of this corrective action effectiveness evaluation support the following recommendations:

- LUCs should remain in place at the site.
- Groundwater, surface water, and sediment sampling should be reduced to a quinquennial frequency to support future five year reviews because the SOB did not identify any surface water or sediment ECCs.
- The partnering team should develop an investigation to further evaluate the arsenic exceedance in groundwater near monitoring well S1MW-07.
- The NAS Key West Partnering Team should develop timelines for implementing these recommendations.

3.1.8 Protectiveness Statement

The remedy is protective of human health and the environment.

3.1.9 LTM Optimization

The APM program requires collection of groundwater and surface water samples at SWMU 1 per the PMP (TtNUS, 2000c), PMP Addendum (Battelle, 2012a) and the Sampling and Analysis Plan Addendum 1 (Battelle, 2012b). Discussion of non-COC groundwater and surface water sampling and analysis is presented in the following Sections.

Florida CTLs for groundwater and surface water enumerated in FAC Chapter 62-777 have been updated since the current action levels were adopted. This has led to increases in CTLs for some constituents and decreases for others. LUCs prevent human contact with contaminated groundwater and surface water, therefore, these media represent incomplete pathways to human receptors. The groundwater to surface water pathway may be complete for certain ecological receptors.

3.1.9.1 Groundwater

Two monitoring wells (S1MW07 and S1MW09) at SWMU 1 (Figure 3-2) were sampled in December 2013 for metals, VOCs, SVOCs, and pesticides. Detections within each analytical suite are discussed below.

Metals. Groundwater samples were analyzed for the complete suite of TAL metals and tin, as established in Site Investigation Work Plan for 10 BRAC Sites (B&RE, 1998b) and agreed upon by the Partnering Team. Nine of the 24 metals analyzed were detected, with only one analyte (arsenic) exceeding the groundwater action level in one sample (Figure 3-2 and Appendix A, Table 5).

VOCs. Groundwater samples were analyzed for the complete suite of Appendix IX VOCs. No VOCs were detected (Appendix A, Table 6).

SVOCs. Groundwater samples were analyzed for the complete suite of Appendix IX SVOCs. Of the SVOCs only bis2-ethylhexylphthalate was detected in both site wells, but concentrations were below groundwater and surface water action levels (Appendix A, Table 7).

Pesticides. Groundwater samples were analyzed for the complete suite of Appendix IX pesticides. No pesticides were detected (Appendix A, Table 8).

It should be noted that the project action levels are based in part on primary drinking water MCLs. FAC Chapter 62-777 provides for a CTL equal to 10 times the primary standard for “poor quality” groundwater. The groundwater at SWMU 1 should qualify as nonpotable GIII groundwater under FAC Chapter 62-520 owing to its high salinity. Since the groundwater is nonpotable, it should also qualify for the “poor quality” CTL category under FAC 62-777. This interpretation would enable the application of less stringent CTLs for certain groundwater analytes. Appendix B presents a comparison of 2014 groundwater CTLs with the project action levels.

Only two monitoring wells are currently monitored. It is not clear whether sufficient groundwater characterization has occurred to fully delineate groundwater pathways. This potential concern is mitigated by the fact that no potential groundwater pathways appear to be complete. LUCs prevent exposure to human receptors, and the baseline ERA concluded that risk to ecological receptors was negligible.

3.1.9.2 Surface Water

Surface water samples were collected from five locations (S1SW01 through S1SW05) at SWMU 1 (Figure 3-1) and analyzed for metals, SVOCs, and pesticides. Detections within each analytical suite are discussed below.

Metals. Surface water samples from all five locations (S1SW01 through S1SW05) were analyzed for the complete suite of TAL metals, as well as tin. A number of metals were detected. Of the metals, beryllium, copper, iron, lead, manganese, and tin exceeded surface water action levels in one or more samples (Figure 3-2 and Appendix A, Table 9).

SVOCs. Surface water samples from two locations (S1SW01 and S1SW02) were analyzed for the complete suite of Appendix IX SVOCs. Of the SVOCs only bis-2-ethylhexylphthalate was detected, and exceeded the surface water action level (Figure 3-2 and Appendix A, Table 10).

Pesticides. Surface water samples from three locations (S1SW02, S1SW04 and S1SW05) were analyzed for the complete suite of Appendix IX pesticides. No pesticides were detected (Appendix A, Table 11).

It should be noted that current (2014) surface water CTLs in FAC Chapter 62-777 have been updated. These updates result in increases or decreases to specific CTLs that cause them to differ from the current project action levels for surface water. Appendix B presents a comparison of 2014 groundwater CTLs with the project action levels.

3.1.9.3 Sediment

Sediment samples were collected from five locations (S1SD01 through S1SD05) at SWMU 1 (Figure 3-1) and analyzed for metals, PAHs, and pesticides. Detections within each analytical suite are discussed below.

Metals. Sediment samples from all five locations (S1SD01 through S1SD05) were analyzed for the complete suite of TAL metals, as well as tin. All of the 21 metal analytes were detected in one or more samples. A total of 15 analytes exceeded sediment action levels at one or more locations (Figure 3-3 and Appendix A, Table 12).

PAHs. Sediment samples from all five locations (S1SD01 through S1SD05) were analyzed for a reduced list of Appendix IX PAHs. All of the 17 PAH analytes were detected in one or more samples. With the exception of benzo(k)fluoranthene, all PAH analytes exceeded sediment action levels at one or more locations (Figure 3-4 and Appendix A, Table 13).

Pesticides. Sediment samples from all five locations (S1SD01 through S1SD05) were analyzed for the complete suite of Appendix IX pesticides. Of the pesticides only three analytes were detected (i.e., 4,4'-DDD, 4,4'-DDE, and 4,4'-DDT), and each analyte exceeded the sediment action level in one or more locations (Figure 3-4 and Appendix A, Table 14).

SQAGs, referenced in FAC Chapter 62-777, are used as the primary screening criteria. The SQAGs have not been formally revised since their original publication in 1994.

3.1.10 Next Review

The next corrective action effectiveness evaluation for SWMU 1 is due to be completed five years following the signature date of this report.

3.2 SWMU 2 – BOCA CHICA DDT MIXING AREA

This section describes the corrective action effectiveness evaluation for SWMU 2, the Boca Chica DDT Mixing Area.

3.2.1 History and Site Chronology

A list of important SWMU 2 historical events and relevant dates in the site chronology is shown below.

Date	Event or Activity
1940s - early 1970s	Site operations
June 1982	DDT Mixing Building 915 demolished
unknown	AST removal, spillage occurred
May 1985	IAS Report produced by Envirodyne Engineers, Inc.
March 1987	Verification study assessment issued by G&M
April 1988	VSI performed by EPA as documented in the RFA Report
January 1991	Preliminary RI Report issued by IT
June 1994	RFI/RI Report issued by IT
November 1995	Delineation Sampling Report for IRA issued by BEI
April 1996	IRA excavation completed by BEI
July 1997	Supplemental RFI/RI Report for high-priority sites produced by B&RE
March 1998	CMS Report issued by TtNUS
July 1998	SOB issued by TtNUS
April 2000	First year of quarterly performance monitoring implemented by TtNUS
January 2002	APM conducted by TtNUS
January 2003	APM conducted by TtNUS
July 2003	RCRA CAMP (Rev. 4) conducted by TtNUS
January 2004	APM conducted by REA Remedial Solutions
December 2004	First Five-Year Review conducted by TtNUS
February 2005	APM conducted by REA Remedial Solutions
February 2006	APM conducted by REA Remedial Solutions
January 2007	APM conducted by REA Remedial Solutions
December 2007	Post storm surge evaluation conducted by TtNUS
January 2008	APM conducted by REA Remedial Solutions
January 2009	APM conducted by OHC Environmental Engineering
November 2009	Draft Uniform Federal Policy Sampling and Analysis Plan, SWMU 2
April 2010	APM conducted by OHC Environmental Engineering*
July 2010	Second five-year review conducted by TtNUS
August 2010	Sampling of ditch sediment and surface water by TtNUS*
December 2011	APM conducted by ECS*
December 2012	APM conducted by ECS*
December 2013	APM conducted by Battelle*
December 2014	APM conducted by Battelle

*Represents sample data covered by this corrective action effectiveness evaluation.

3.2.2 Background

3.2.2.1 Site Description

SWMU 2, the former Boca Chica DDT Mixing Area, is located in the central portion of Boca Chica Key along the southeast side of a taxiway (Figure 3-5). The unit is within an active airstrip and is completely surrounded by runways and taxiways. SWMU 2 consists of the former location of Building 915 and its surrounding area, which was used for the storage and mixing of pesticides from the mid-1940s to the early 1970s. Building 915 was demolished in 1982. The site covers approximately 0.25 acre and contains a manmade ditch that receives surface water runoff from SWMU 2 and the area north of the site.

Surface water in the ditch at the site is not used for recreation, but does support aquatic life. The ditch flows into a 15-acre lagoon which also supports aquatic life and a variety of birds. An underground drainage pipe connects the west end of the ditch to a drainage system that terminates on the northwestern boundary of NAS Key West and connects to open waters of the State of Florida.

Two ASTs (a 500-gallon mixing tank and a 1,000-gallon storage tank) on concrete foundations were located to the west of Building 915. DDT contamination at the site reportedly occurred during the removal of the ASTs, when some spillage occurred (G&M, 1987). Contamination may also have occurred when pesticides were mixed with waste fuel oil to allow the pesticides to float on the surface of any standing water in order to help destroy insect larvae (IT, 1994).

3.2.2.2 Summary of Sampling Results

Media sampling at SWMU 2 was conducted to characterize constituent types and distributions. Sampling was performed in 1986, 1990, 1993, and 1995 during a series of remedial investigations. Pesticide contamination was identified in all media and the RFI/RI recommended further sampling and analysis to adequately delineate this contamination. In addition, the report recommended an IRA to prevent further migration of soil contamination to surrounding water bodies (IT, 1994).

The primary COCs identified at SWMU 2 are DDT, DDE, and DDD. DDT and its metabolites, DDD and DDE, which are listed as RCRA wastes when these products have been spilled and have contaminated soil or debris. Soil contaminated with these chemicals is classified as hazardous waste (RCRA waste Codes U060 and U061).

3.2.2.3 1996 Interim Remedial Action

The Remediation Work Plan for the contaminated soil and sediment removal was prepared by BEI in 1995 (BEI, 1995b). Delineation sampling was performed to establish cleanup boundaries, nearly doubling the size of the planned soil excavation. The remedial action consisted of blocking water flow into the ditch with water-filled cofferdams, suction-dredging all sediments from the ditch, and excavating the contaminated soil around the ditch. Approximately 1,950 cubic yards of contaminated soil were removed from the excavated area and disposed. The majority of the contaminated sediment was removed with an excavator. The remaining sediment was vacuumed from the site using a trash pump. The water in the ditch was cleaned by repeated filtration until the DDT concentration was less than 1.0 μg/L. Confirmation sampling of sediment and surface

water was performed to determine the effectiveness of the removal before the area was backfilled. IRA activities were completed in April 1996 (BEI, 1998).

3.2.2.4 Summary of Risk

An HHRA and ERA were performed as part of the Supplemental RFI/RI (B&RE, 1997). No HHRA-based COCs were selected for SWMU 2 because in no instance did any receptor scenario have a cumulative risk above a level of concern (1×10^{-4} to 1×10^{-6} for cancer risk or an HI of 1.0). However, COCs in surface water were identified at SWMU 2 due to exceedance of ARARs (B&RE, 1997)

The ERA, which was based on samples collected in January 1996 (i.e., prior to the 1996 IRA), concluded that potential risks to aquatic and piscivorous receptors from 4,4'-DDT and its degradation products are present in sediment and surface water. The ERA also stated that the efficacy of the IRA should be evaluated before taking any additional removal actions.

Based on the HHRA and BRA, site COCs and ECCs, and their respective media at SWMU 2 are summarized as follows:

Exposure Medium	COC for Human Health Risk	ECC for Ecological Risk
Soil	none	none
Groundwater	none	none
Surface Water	4,4'-DDD 4,4'-DDT Aldrin Beta BHC Heptachlor	4,4'-DDD 4,4'-DDE 4,4'-DDT
Sediment	none	4,4'-DDD 4,4'-DDE 4,4'-DDT
Biota (fish tissue)	none	4,4'-DDD 4,4'-DDE 4,4'-DDT

3.2.3 Remedial Actions

3.2.3.1 Remedy Selection

A CMS was performed to determine the appropriate remedy for the site based on post-remediation sample data (B&RE, 1998c). ICs, consisting of LUCs with monitoring, were chosen as the remedy for SWMU 2. This remedy is summarized in the SOB for SWMU 2 (TtNUS, 1998e).

RAOs for SWMU 2 are not explicitly stated in the SOB, but can be reasonably inferred from the results of the baseline HHRA, ERA, and the CMS, as follows:

- Prevent human and ecological receptors from contacting contaminants in soil, sediment and surface water at concentrations which would result in adverse effects.
- Prevent the migration of surface soil contaminants to the drainage ditch via runoff and subsequent migration to surface water and sediment.

3.2.3.2 Remedial Implementation

3.2.3.2.1 LUCs with Long-Term Monitoring

LUCs were developed by the NAS Key West Partnering Team and implemented through LUCIPs. These LUCs were designed to ensure protection of human health and the environment by restricting future site use and accessibility, educating NAS personnel, and maintaining records of contamination. The LUCs documented in the NAS Key West Base Master Plan prevent future residential use at this site. The LUCIP for SWMU 2 includes the placement and maintenance of signs around the site perimeter which state that trespassing and dumping are not permitted at the site. Personnel from the NAS Key West Public Works Department are required to visually inspect SWMU 2 at least once every three months to ensure that all LUCs are being implemented and signs are in good condition. The NAS Key West Public Works Department submits an annual report to FDEP describing the results of the quarterly inspections.

The SOB prescribed annual monitoring of groundwater, surface water, and sediment, and biennial biomonitoring of fish tissue over the course of 10 years to evaluate the effectiveness of the IRA and determine if additional remedial action is warranted. A performance monitoring plan defined the monitoring program including quarterly monitoring for the first year and subsequent annual monitoring. The quarterly monitoring began in April 2000 and was completed in January 2001 (TtNUS, 2001a). Groundwater, surface water, and sediment samples were collected annually from 2002 through 2009. Monitoring of ecological receptors was performed in October 2000 and January 2003 and involved pesticide and metals analysis of fish and vegetation (TtNUS, 2001b; 2003a).

The first five-year review (TtNUS, 2004a) recommended discontinuing biomonitoring for the following reasons:

- Concentrations of COCs in sea oxeye daisy samples from SWMU 2 were similar to background values and pose no risk to herbivorous mammals.
- Organochlorine pesticides such as DDT, DDD, and DDE are long-lived in the environment, and these pesticides are expected to remain in sediment and fish for the foreseeable future.

In November 2006, a storm surge investigation was initiated to determine if the storm surge from Hurricane Wilma in October 2005 had caused contaminants to migrate outside the established site boundary for SWMU 2. Soil, sediment, and surface water samples were collected in November 2006 and evaluated with results from annual monitoring to assess the effectiveness of the site remedy. Elevated pesticide concentrations were detected in the sediment of the lagoon east of SWMU 2 and the pond to the south. These locations were not sampled before the storm surge investigation; therefore, it is not certain whether the elevated concentrations were due to the storm surge, or to pre-existing conditions. However, the results indicated that contamination extended beyond the established SWMU 2 boundary. The NAS Key West Partnering Team agreed in its March 2007 meeting to expand the SWMU 2 site boundary to the east and the south to include the lagoon and the pond (Figure 3-5).

3.2.3.2.2 2011-2014 Airfield Restoration Project

An airfield restoration project began construction in October 2011 to restore airfield clear zones and improve the stormwater drainage systems at Boca Chica Field. Activities near SWMU 2 included clearance of mangrove along the surface water ditch and neighboring lagoon to remove visual obstructions between the flightline and taxiway adjacent to the site. No site media (soil, sediment, surface water or groundwater) within the LUC boundary of the site were disturbed.

3.2.3.3 Sampling since the Previous Five-Year Review

Five annual sampling events involving the monitoring of groundwater, surface water, and sediment have been conducted since the previous five-year review in July 2010; these events were conducted in January 2010 (OHC, 2010), December 2011 (ECS, 2012), December 2012 (ECS, 2013), December 2013 (Battelle, 2015), and December 2014.

An additional investigation of the storm water drainage system leading from SWMU 2 to open waters of the State was conducted in 2010. This investigation included sampling of surface water and sediment in the drainage system to determine if open water are being impacted by residual contamination at SWMU 2.

3.2.4 Five-Year Review Process

3.2.4.1 Document Review

3.2.4.1.1 Previous Five-Year Review

The previous five-year review (the second corrective action effectiveness evaluation) for SWMU 2 concluded that the remedy for SWMU 2 was not protective for certain ecological receptors (TtNUS, 2010a). Specifically, the previous review concluded that the existing remedy does not appear to be protective of benthic (sediment dwelling) receptors in the ditch at SWMU 2. The second five review (TtNUS, 2010a) stated: “Sediment concentrations of DDD, DDE, and DDT in several samples collected from the ditch have exceeded effects range-median (ER-M) and probable effects level (PEL) values, indicating probable risk to benthic receptors. Sediment toxicity tests conducted in support of the Supplemental RFI/RI (B&RE, 1997) indicated poor survival of test organisms, and sediment concentrations of pesticides are still elevated, with concentrations in some samples greater than those measured prior to the IRA.”

The above concern raised in the second five-year review did not appear to take into account the fact that the great majority of the impacted sediment in the ditch was removed in the 1996 IRA in order to protect aquatic and piscivorous receptors (TtNUS, 1998e). This implies that the small amount of impacted remaining sediment that might pose a risk to benthic invertebrates was deemed an acceptable risk. The SOB stated that biomonitoring of pesticides in fish would be appropriate to ensure that concentrations decrease over time (TtNUS, 1998e). This risk management decision was established in the SOB to accept elevated risk to aquatic organisms in the localized remaining sediment in the SWMU 2 ditch, as long as contaminant concentrations remained stable or decreased through time.

The previous five-year review concluded that the existing remedy did appear to be protective of other receptors (i.e., non-benthic organisms) (TtNUS, 2010a), stating “Concentrations of

pesticides in sea oxeye daisy tissue were negligible, and food chain modeling indicated no risk to herbivorous mammals such as the Lower Keys marsh rabbit from consumption of vegetation at SWMU 2. The surface water at SWMU 2 is too saline to be used as drinking water by wildlife, so risks from drinking are not applicable.

"Concentrations of DDD, DDE, and DDT in fish tissue pose risks to birds that forage exclusively at SWMU 2, but risks posed by these pesticides are mitigated by conditions at the site. Wading birds such as herons and egrets and raptors such as ospreys and bald eagles forage over large areas, typically hundreds of acres. The ditch at SWMU 2 where fish were collected is approximately 20 feet wide and 400 feet long, and much of the ditch is covered by a thick overstory of red mangroves. The overstory reduces foraging opportunities for most piscivorous bird species. TtNUS biologists visited SWMU 2 on numerous occasions and have never reported observing ospreys or bald eagles in the vicinity, in spite of the known presence of these species at NAS Key West (TtNUS, 2010a). Herons and egrets have been observed only in the portion of the ditch where trees were removed during the 1996 IRA. The extent to which site-related pesticides pose potential risks to piscivorous birds in the lagoon portion of SWMU 2 is uncertain for two reasons: (1) food items (e.g., fish) have not been collected from the lagoon, and (2) the extent to which piscivorous receptors forage in the lagoon is uncertain. This uncertainty is partially mitigated by the fact that (as stated above) the foraging areas of piscivorous birds are typically hundreds of acres, so the prey items obtained from the lagoon plus the ditch at SWMU 2 would comprise a small portion of a bird's total intake. In addition, the lagoon is adjacent to an active runway and taxiway, where aircraft-related noise and disturbance would reduce the lagoon's apparent attractiveness as a foraging area, at least to some extent. Although the precise extent of foraging cannot be determined, site conditions and the large foraging areas of piscivorous birds (hundreds of acres) compared to the small area comprised by the ditch (0.2 acre) plus the lagoon (15 acres) result in a situation such that fish from SWMU 2 comprise only a small portion of the diet of any piscivorous bird, and therefore, site-related risk to piscivorous birds is minimal."

In summary, TtNUS concluded that the remedy is protective of human health, and is probably protective of piscivorous birds, but the remedy does not appear to be protective of benthic invertebrate receptors in the ditch at SWMU 2, having exceeded ER-M and PEL values (TtNUS, 2010a). The present review concludes that residual risks to benthic invertebrates following the IRA that removed the majority of impacted sediment was deemed acceptable. TtNUS reported that a planned investigation scoped in the SWMU 2 Uniform Federal Policy Sampling and Analysis Plan (UFP SAP) would determine whether sediment contamination is migrating to open waters of the State (TtNUS, 2009a). If pesticides are migrating from SWMU 2 to open waters of the State via the storm water ditch, the selected remedy, as described in the SWMU 2 SOB and summarized in the previous five-year review, would require modification to remain protective of human health and the environment (TtNUS, 2010a).

The results of the additional SWMU 2 investigation described in the previous five-year review are discussed in Section 3.2.4.2.1.

3.2.4.1.2 Other Documents Reviewed

Reports and data from monitoring and investigations conducted from 2010 through 2013 were reviewed for this corrective action effectiveness evaluation. The results of the planned additional investigation referenced in the previous five-year review were published in a report titled SWMU 2 Sampling Report, dated November 2010 (TtNUS, 2010b). The results of this investigation are discussed in Section 3.2.4.2.1.

The most recent available data report reviewed for this corrective action effectiveness evaluation is the 2013 APM Report (Battelle, 2015). Tables 1 through 33 of the 2013 APM Report present information on optimization of monitoring analyte suites as well as compilations of historical data for the APM sites. These tables are included for reference as Appendix A to this report.

The 2012 APM report set forth the decision rules adopted by the NAS Key West Partnering Team in 2012 for optimizing the sampling program. Appendix A, Table 3 contains the APM optimization rules defined by the Partnering Team. Appendix A, Table 4 highlights the APM optimization summary and provides a list of the analytes that qualified to be removed from the APM program based on the decision rules.

3.2.4.2 Data Review and Evaluation

Biological tissue data from SWMU 2 were evaluated in the first five-year review (TtNUS, 2004a). The first five-year review recommended discontinuing biomonitoring for the following reasons, as noted in Section 3.2.3.2.1:

- Concentrations of COCs in sea oxeye daisy samples from SWMU 2 were similar to background values and pose no risk to herbivorous mammals.
- Organochlorine pesticides such as DDT, DDD, and DDE are long-lived in the environment, and these pesticides are expected to remain in sediment and fish for the foreseeable future.

Tissue samples have not been collected in the past five years; therefore, no evaluation of tissue data is included in this report.

3.2.4.2.1 SWMU 2 Storm Water Drainage Investigation

As discussed in Section 3.2.4.1.1, the previous five-year review concluded that the remedy was protective of human health, and protective of piscivorous birds, but was not protective of benthic invertebrate receptors in residual sediment in the ditch. TtNUS reported that a planned investigation scoped in the SWMU 2 UFP SAP would determine whether sediment contamination is migrating to open waters of the State (TtNUS, 2009a). If pesticides are migrating from SWMU 2 to open waters of the State via the storm water ditch, the selected remedy, as described in the SWMU 2 SOB and summarized in the previous five-year review, would require modification to remain protective of human health and the environment (TtNUS, 2010a).

The results of the SWMU 2 Storm Water Drainage Investigation were reported in a Supplemental Sampling Report (TtNUS, 2010b). DDD was the only pesticide detected in surface water samples collected for fixed-base laboratory analysis; it was detected in three of the 10 samples (Figure 3-6). All three DDD detections exceeded the current surface water action level. DDD, DDE and DDT

were detected in all 10 sediment samples; however, concentrations of DDT were below the Florida SQAG. DDD exceeded the Florida SQAG in five of the 10 sediment samples, and DDE exceeded the Florida SQAG in four of the 10 sediment samples (Figure 3-6). Exceedances in both surface water and sediment samples were only found in the upper storm water ditches nearest SWMU 2 and none were found at the National Pollutant Discharge Elimination System (NPDES) Outfall Point (Figure 3-6). The TtNUS report does not provide specific conclusions, but the absence of pesticide CTL exceedances at the NPDES outfall suggests that the potential concern for pesticide migration from SWMU 2 to open waters of the State via the storm water ditch is not a concern.

3.2.4.2.2 APM Monitoring Results

The 2013 APM program required collection of groundwater, surface water, and sediment samples at SWMU 2 per the PMP (TtNUS, 2000c), PMP Addendum (Battelle, 2012a) and the Sampling and Analysis Plan Addendum 1 (Battelle, 2012b). The SOB did not identify groundwater COCs or ECCs. Discussion of non-COC groundwater contaminant concentrations is presented in Section 3.2.9. Surface water COCs and ECCs identified in the SOB consist of the pesticides 4,4'-DDD , 4,4'-DDE, 4,4'-DDT, Aldrin, beta BHC, and Heptachlor. Surface water samples from five locations (S2SW01 through S2SW05) were analyzed for a reduced list of Appendix IX pesticides (Figure 3-7). Of the four monitoring events reviewed for this report, only one pesticide (4,4'-DDT) was detected in 2013, at one location, slightly above the surface water action level (Appendix A, Table 18). Discussion of non-COC surface water contaminant concentrations is presented in Section 3.2.9.2. Sediment COCs and ECCs identified in the SOB also consist of 4,4'-DDD, 4,4'-DDE and 4,4'-DDT. Sediment samples were collected from five locations (S2SD01 through S2SD05) at SWMU 2 (Figure 3-8). 4,4'-DDD, 4,4'-DDE and/or 4,4'-DDT exceeded the sediment action level in one or more locations (Figure 3-8 and Appendix A, Table 20). Discussion of non-COC sediment concentrations is presented in Section 3.2.9.3.

3.2.4.3 Site Inspection and Interviews

LUCs are inspected quarterly, and an annual report is prepared and submitted to FDEP. Selected annual LUC compliance reports were reviewed for this five-year review. In addition, a specific site inspection, including interviews, was conducted for the five-year review. Information was recorded on site inspection/interview forms that are presented in Appendix C. No significant issues have been identified. Since access to the site is restricted, trespassing is minimal. In addition, warning signs are in place around the site perimeter, notifying base personnel that access to SWMU 2 is restricted.

3.2.5 Technical Assessment

The technical assessment is focused on three primary questions, each of which is presented below.

3.2.5.1 Question A

Is the remedy functioning as intended by the decision documents?

The remedy is functioning as intended, to protect human health through LUCs and monitoring of environmental media to document concentration reductions of pesticide COCs following the IRA.

NAS Key West personnel perform quarterly visual inspections to ensure adherence to LUCs, and an annual report is submitted to FDEP describing the results of the quarterly inspections. Annual monitoring of groundwater, surface water, and sediment is conducted and is reported to FDEP. Warning signs are in place around the site perimeter, reducing the likelihood of trespassing and limiting potential exposure to base personnel. In addition, fishing is not allowed at SWMU 2, eliminating risks to human health from consumption of potentially contaminated fish. Any changes in site usage would need to address the contaminants that remain at SWMU 2.

3.2.5.2 Question B

Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy selection still valid?

There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. There has been no change to the standardized risk assessment methodology that could affect the protectiveness of the remedy. Florida CTLs have been updated since the time of the SOB (TtNUS, 1998e). Toxicity data for selected individual contaminants have also been updated; however, these updates do not affect the protectiveness of the remedy to human receptors because LUCs prevent exposures.

SQAGs, referenced in FAC Chapter 62-777, are used as the primary screening criteria. The SQAGs have not been formally revised since their original publication in 1994, but toxicity values for individual contaminants on which the SQAGs are based have been revised. A risk management decision was made to accept elevated ecological risk.

The RAOs remain valid.

3.2.5.3 Question C

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

While no new information has come to light that calls into question the protectiveness of the remedy, results from the 2010 storm water ditch investigation indicate that pesticides from SWMU 2 are not migrating to open waters of the State beyond the NPDES outfall point (Figure 3-6).

No new ecological receptors or human usage of the site were identified during long-term monitoring or during the five-year period.

3.2.5.4 Technical Assessment Summary

Based on the data reviewed, the remedy is functioning as intended by the SOB and HSWA permit. There have been no changes to the standardized risk assessment methodology that could affect the protectiveness of the remedy.

LUCs prevent human contact with contaminated groundwater and surface water, therefore, these media represent incomplete pathways to human receptors.

The baseline ERA concluded that, while there was risk to aquatic receptors, this risk had been mitigated by removal of sediment during the IRA. The SOB selected monitoring of environmental media as the remedy to demonstrate stability and/or declines in COC concentrations through time

to address ecological receptors of greatest concern, upper trophic and piscivorous birds, because the source of the pesticides had been removed.

This review did not produce any other information that calls into question the protectiveness of the remedy.

3.2.6 Issues

This five-year review did not identify any issues that could impact the remedy.

3.2.7 Recommendations and Follow-up Actions

The findings of this corrective action effectiveness evaluation support the following recommendations:

- LUCs should remain in place at the site.
- Groundwater, surface water, and sediment monitoring should be reduced to a quinquennial frequency to support future five year reviews.
- The NAS Key West Partnering Team should develop timelines for implementing these recommendations.

3.2.8 Protectiveness Statement

The SWMU 2 remedy is protective of human health and the environment.

3.2.9 LTM Optimization

Florida CTLs for groundwater and surface water enumerated in FAC Chapter 62-777 have been updated since the current action levels were adopted. This has led to increases in CTLs for some constituents and decreases for others. LUCs prevent human contact with contaminated groundwater and surface water, therefore, these media represent incomplete pathways to human receptors. The groundwater to surface water pathway may be complete for certain ecological receptors.

In addition, the groundwater is nonpotable and should qualify for the GIII classification under FAC Chapter 62-520. This, in turn, should qualify the groundwater as “poor quality” for purposes of determining appropriate CTLs under FAC 62-777. The Navy should work with FDEP to bring project action levels into alignment with current CTLs. A comparison of 2013 project action levels and 2014 CTLs is provided in Appendix B.

3.2.9.1 Groundwater

Three monitoring wells (S2MW05, S2MW06, and S2MW07) at SWMU 2 (Figure 3-7) were sampled in December 2013 for metals and pesticides. Detections within each analytical suite are discussed below.

Metals. Groundwater samples were analyzed solely for tin in December 2013. Tin was not detected in any samples (Figure 3-7 and Appendix A, Table 15).

Pesticides. Groundwater samples from SWMU 2 were analyzed for a reduced list of Appendix IX pesticides. Only 4,4’-DDD and 4,4’-DDE were detected, but were below the groundwater

action levels (Figure 3-7 and Appendix A, Table 16). 4,4'-DDD concentrations exceeded the surface water action level in one or more samples.

It should be noted that the project action levels are based in part on primary drinking water MCLs. FAC Chapter 62-777 provides for a CTL equal to 10 times the primary standard for "poor quality" groundwater. The groundwater at SWMU 2 should qualify as nonpotable GIII groundwater under FAC Chapter 62-520 owing to its high salinity. Since the groundwater is nonpotable, it should also qualify for the "poor quality" CTL category under FAC 62-777. This interpretation would enable the application of less stringent CTLs for certain groundwater analytes. Appendix B presents a comparison of 2014 groundwater CTLs with the project action levels.

3.2.9.2 Surface Water

Surface water samples were collected from five locations (S2SW01 through S2SW05) at SWMU 2 (Figure 3-7) and analyzed for metals. Two metals were detected in 2013 (copper and iron) and no exceedances were reported (Figure 3-7 and Appendix A, Table 17).

It should be noted that current (2014) surface water CTLs in FAC Chapter 62-777 have been updated. These updates result in increases or decreases to specific CTLs that cause them to differ from the current project action levels for surface water. Appendix B presents a comparison of 2014 groundwater CTLs with the project action levels.

3.2.9.3 Sediment

Sediment samples were collected from five locations (S2SD01 through S2SD05) at SWMU 2 (Figure 3-8) and analyzed for metals. Of the 14 metals analyzed, 13 were detected and six metals (cadmium, cobalt, copper, iron, lead and tin) exceeded their respective sediment action level in one or more samples (Figure 3-8 and Appendix A, Table 19).

3.2.10 Next Review

The next corrective action effectiveness evaluation for SWMU 2 is due to be completed five years following the signature date of this report.

3.3 SWMU 3 – BOCA CHICA FIRE-FIGHTING TRAINING AREA

This section describes the corrective action effectiveness evaluation for SWMU 3, the former Boca Chica Fire-Fighting Training Area.

3.3.1 History and Site Chronology

A list of important SWMU 3 historical events and relevant dates in the site chronology is shown below. The identified events are intended to be illustrative, rather than comprehensive.

Date	Event or Activity
May 1985	IAS Report issued by Envirodyne Engineers, Inc.
March 1987	Verification study assessment produced by G&M
January 1991	Preliminary RI Report issued by IT
June 1994	RFI/RI Report issued by IT
October 1995	IRA excavation completed by BEI
July 1997	Supplemental RFI/RI Report for high-priority sites issued by B&RE

July 1998	SOB for SWMU 3 issued by TtNUS
July 2003	RCRA CAMP (Rev. 4) issued by TtNUS
December 2004	First five-year review conducted by TtNUS
March 2008	Well Abandonment Report for Various Sites issued by TtNUS
July 2010	Second five-year review conducted by TtNUS

3.3.2 Background

3.3.2.1 Site Description

The former Boca Chica Fire-Fighting Training Area is a flat open area located in the southeastern portion of Boca Chica Key, west of the southern blimp pad (Figure 3-9). The site contained aircraft and vehicles that were ignited with flammable liquids (jet fuel, waste oils, or hydraulic fluids) for use in fire-fighting training. The area contained two unlined circular pits, each approximately 100 feet in diameter and 2 to 3 feet deep, which were also ignited using combustible liquids. A shallow, 16-acre lagoon lined by red and black mangroves lies approximately 200 feet to the south and west of the former training pits. The lagoon is landlocked and therefore not connected to open ocean water. Dominant fish species in the lagoon are those known to be tolerant of high temperatures, low dissolved oxygen concentrations, and fluctuating salinities (e.g., sailfin molly, sheepshead minnow, American eel) (B&RE, 1997).

3.3.2.2 Summary of Sampling Results

Sampling was performed in 1986, 1990, 1993, 1995, and 1996 during a series of investigations at the site. The 1994 RFI/RI conducted by IT indicated that fire-fighting training conducted in the pits at SWMU 3 resulted in contamination of the groundwater and soil. Light non-aqueous phase liquid (LNAPL) was discovered on the water table surface in one monitoring well located in the southern pit. The LNAPL was characterized as either diesel fuel, jet propellant (JP-5) fuel, or a combination of both. Petroleum hydrocarbon contamination was also identified in monitoring wells associated with the northern pit (IT, 1994).

3.3.2.3 1995 Interim Remedial Action

As a result of the 1994 RFI/RI, an IRA was conducted at SWMU 3. The IRA objective was contaminant source removal from the southernmost of the two circular pits to prevent further migration of petroleum contamination into groundwater. Data from delineation sampling established the boundary for petroleum-impacted soil as the entire southern burn pit. More than 700 cubic yards of soil were removed and disposed from the southern burn pit in 1995 (BEI, 1998).

3.3.2.4 Summary of Risk

The Supplemental RFI/RI for high-priority sites determined that metals were present in soil, sediment, and surface water at SWMU 3, but at concentrations only slightly above action levels. VOCs and PAHs were also present in groundwater. A baseline HHRA and ERA were performed as part of the Supplemental RFI/RI. The HHRA determined that carcinogenic risks were greater than 1×10^{-6} for the hypothetical adult trespasser, adolescent trespasser, and future resident. Arsenic in sediment was the principal contributor to the carcinogenic risk. The non-carcinogenic

residential hazard index was slightly above the 1.0 benchmark. Antimony and thallium in surface water were the principal contributors to noncarcinogenic hazard (B&RE, 1997). The ERA concluded that ecological risks were negligible (B&RE, 1997).

Based on the HHRA and BRA, site COCs and ECCs, and their respective media at SWMU 3 are summarized as follows:

Exposure Medium	COC for Human Health Risk	ECC for Ecological Risk
Soil	none	none
Groundwater	none	none
Surface Water	antimony thallium	none
Sediment	arsenic	none

3.3.3 Remedial Actions

3.3.3.1 Remedy Selection

LUCs were selected as the remedy for SWMU 3 by the NAS Key West Partnering Team. The LUCs were designed to eliminate or reduce exposure pathways by limiting site access. This remedy is protective of human health by restricting future site use. Additional information regarding the selection of LUCs as a remedy for SWMU 3 is provided in the SOB for SWMU 3 (TtNUS, 1998f).

The RAO for SWMU 3 is not explicitly stated in the SOB, but can be reasonably inferred from the results of the baseline HHRA, ERA, and from the risk management decisions described in the SOB, as follows:

- Prevent contact between human receptors and site COCs.

3.3.3.2 Remedy Implementation

LUCs were developed through LUCIPs. These controls were designed to ensure protection of human health by restricting future site use and accessibility, educating NAS personnel, and maintaining records of contamination. The LUCs documented in the NAS Key West Base Master Plan prevent future residential use at this site. In addition, access to SWMU 3 is restricted, since the site is near an active air strip on an active military base with no planned change in site usage for the foreseeable future. Furthermore, personnel from the NAS Key West Public Works Department are required to visually inspect SWMU 3 on a quarterly basis to ensure that all LUCs are being implemented and properly maintained. The NAS Key West Public Works Department submits an annual report to FDEP describing the results of the quarterly inspections.

3.3.4 Five-Year Review Process

3.3.4.1 Document Review

No sampling has occurred since the previous five-year review (TtNUS, 2010a), and no documents have been generated pertaining to SWMU 3. Therefore, a document review was not applicable for this corrective action effectiveness evaluation.

3.3.4.2 Data Review and Evaluation

Because the selected remedy is LUCs with no active monitoring, no analytical data have been generated since the remedy was implemented.

3.3.4.3 Site Inspection and Interviews

LUCs are inspected quarterly, and an annual report is prepared and submitted to FDEP. Selected annual LUC compliance reports were reviewed for this five-year review. In addition, a specific site inspection, including interviews, was conducted for the five-year review. Information was recorded on site inspection/interview forms that are presented in Appendix C. No significant issues have been identified. Since access to the site is restricted, trespassing is minimal.

3.3.5 Technical Assessment

The technical assessment is focused on three primary questions, each of which is presented below.

3.3.5.1 Question A

Is the remedy functioning as intended by the decision documents?

The remedy is functioning as intended to protect human health and the environment. SWMU 3 is located on an active military base, and access to the base is restricted. NAS Key West personnel perform quarterly visual inspections to ensure adherence to LUCs, and an annual report is submitted to FDEP describing the results of the quarterly inspections. There is no planned change in site usage for the foreseeable future.

3.3.5.2 Question B

Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy selection still valid?

There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. There have been no significant changes to the standardized risk assessment methodology that could affect the protectiveness of the remedy. Florida CTLs have been updated since the time of the SOB (TtNUS, 1998f). Toxicity data for selected individual contaminants have also been updated; however, these updates do not affect the protectiveness of the remedy because LUCs limit exposure to human receptors. The baseline ERA concluded that ecological risk was negligible. The SOB recommended that LUCs be selected as the remedy to prevent exposure to human receptors. Updated CTLs and toxicity criteria would not change this condition. The RAOs remain valid.

3.3.5.3 Question C

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

No new ecological receptors or human usage of the site have been identified for SWMU 3. There is no known information that calls into question the protectiveness of the remedy.

3.3.5.4 Technical Assessment Summary

Based on site inspections, the remedy is functioning as intended by the SOB and HSWA permit. There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. There have been no changes to the standardized risk assessment methodology that could affect the protectiveness of the remedy. Florida CTLs have been updated since the time of the SOB (TtNUS, 1998f). Toxicity data for selected individual contaminants have also been updated; however, these updates do not affect the protectiveness of the remedy because LUCs limit exposure to human receptors. The baseline ERA concluded that ecological risk was negligible. There is no other information that calls into question the protectiveness of the remedy.

3.3.6 Issues

This corrective action effectiveness evaluation did not identify any issues that could impact the remedy.

3.3.7 Recommendations and Follow-up Actions

LUCs should remain in place at the site. There are no other recommendations or follow-up actions for SWMU 3.

3.3.8 Protectiveness Statement

The remedy is protective of human health and the environment.

3.3.9 Next Review

The next corrective action effectiveness evaluation for SWMU 3 is due to be completed five years following the signature date of this report.

3.4 SWMU 5 – BOCA CHICA AIMD BUILDING A-990 SAND BLASTING AREA

This section describes the corrective action effectiveness evaluation for SWMU 5, Boca Chica AIMD Building A-990 Sand Blasting Area.

3.4.1 History and Site Chronology

A list of important SWMU 5 historical events and relevant dates in the site chronology is shown below.

Date	Event or Activity
1970-1995	Sand blasting operations
June 1994	RFI/RI Report issued by IT
January 1998	Supplemental RFI/RI Report for eight sites issued by B&RE
March 1999	CMS Report for SWMU 5 prepared by TtNUS
February 1999	SOB SWMU 5 issued by TtNUS
April 2000	First year of quarterly performance monitoring implemented by TtNUS
January 2002	APM conducted by TtNUS
January 2003	APM conducted by TtNUS
July 2003	RCRA CAMP (Rev. 4) prepared by TtNUS
January 2004	APM conducted by REA Remedial Solutions
December 2004	First Five-Year Review conducted by TtNUS
February 2005	APM conducted by REA Remedial Solutions

February 2006	APM conducted by REA Remedial Solutions
January 2007	APM conducted by REA Remedial Solutions
December 2007	Post Storm Surge Evaluation conducted by TtNUS
January 2008	APM conducted by REA Remedial Solutions
January 2009	APM conducted by OHC Environmental Engineering
April 2010	APM conducted by OHC Environmental Engineering *
July 2010	Second Five-Year Review conducted by TtNUS
December 2011	APM conducted by ECS*
December 2012	APM conducted by ECS*
December 2013	APM conducted by Battelle*
December 2014	APM conducted by Battelle

*Represents sample data covered by this corrective action effectiveness evaluation.

3.4.2 Background

3.4.2.1 Site Description

SWMU 5, Boca Chica AIMD Building A-990 Sand Blasting Area, is located at the western end of the airfield on Boca Chica Key (Figure 3-10). The sand blasting area was located between Buildings A-990 and A-989, and measured approximately 65 feet by 90 feet. Sand blasting residue was normally left on the ground or stockpiled for disposal. The area was historically used to sand blast “yellow gear” (the ground handling/ground support equipment for aircraft, i.e., moving vehicles and refueling tankers), aircraft parts, and various metal objects as needed by the facility from the early 1970s until 1995. Paint residues and other materials produced by the sand blasting of equipment, parts, and vehicles were potential sources of contamination (B&RE, 1998a).

Immediately south of the site is a concrete ditch that collects storm water runoff from the AIMD area and transports it westward. The concrete ditch ends in a small grassy area approximately 300 feet west of the site. During heavy rainfall events, storm water flows overland past this area to a shallow pond. The pond is connected by a culvert under a paved road to an extensive area of large lagoons south of the road (Figure 3-10). A large berm vegetated with grass, weeds, and Australian pines is located immediately south of the concrete ditch (B&RE, 1998a).

3.4.2.2 Summary of Sampling Results

In June 1984, the Navy collected soil and groundwater samples at SWMU 5. Phenol was detected in soil samples (IT, 1994). An RFI/RI was conducted in 1993 that included collection and analysis of soil, sediment, surface water, and groundwater from the site. The RFI/RI reported that cyanide exceeded the drinking water standard in groundwater. Surface water and sediment at the site appeared to be impacted by metals, attributed to leaching or transport of waste material from the sandblasting area into the ditch. The RFI/RI Report recommended additional sampling of the groundwater, surface water, and sediment, conducting an IRA to reduce migration of contamination, and performing a HHRA based on post- IRA sampling data (IT, 1994). However, an IRA was not performed at SWMU 5 following the RFI/RI (B&RE, 1998a).

In 1996, additional sampling was performed as part of the Supplemental RFI/RI. Metals were the most frequent soil and sediment contaminants, but were detected at low concentrations. Metals

associated with sandblasting activities (cadmium and chromium) were detected in groundwater and surface water, as well as arsenic, which is not normally associated with sandblasting.

3.4.2.3 Summary of Risk

A HHRA and an ERA were performed as part of the Supplemental RFI/RI for eight sites (B&RE, 1998a). The HHRA determined that contaminants were present at concentrations indicating that adverse carcinogenic and non-carcinogenic health effects might occur for the hypothetical future resident. Arsenic was one of the largest contributors to the human health risk. The ERA concluded that potential risks to terrestrial and aquatic receptors at SWMU 5 are low. Soil, surface water, and sediment contaminants do not appear to have bioaccumulated in vegetation or fish to any significant extent. In addition, terrestrial habitat at the site is of minimal areal extent and quality, resulting in minimal use of the site and vicinity by terrestrial receptors. (B&RE, 1998a). The Supplemental RFI/RI for eight sites recommended that a CMS be conducted (B&RE, 1998a).

Based on the HHRA and BRA, site COCs and ECCs, and their respective media at SWMU 5 are summarized as follows:

Exposure Medium	COC for Human Health Risk	ECC for Ecological Risk
Soil	arsenic beryllium	none
Groundwater	none	none
Surface Water	none	none
Sediment	arsenic beryllium chromium	none

3.4.3 Remedial Actions

3.4.3.1 Remedy Selection

The CMS determined that the appropriate remedy for SWMU 5 was ICs, consisting of LUCs with monitoring (TtNUS, 1999f). The LUCs were designed to eliminate or reduce exposure pathways by limiting site access. Additional information regarding the selection of LUCs with monitoring is documented in the SOB for SWMU 5 (TtNUS, 1999g).

The RAO for SWMU 5 is not explicitly stated in the SOB, but can be reasonably inferred from the results of the baseline HHRA, ERA, and the CMS, as follows:

- Prevent contact between human receptors and site COCs.

3.4.3.2 Remedy Implementation

LUCs were developed by the NAS Key West Partnering Team and implemented through LUCIPs. These LUCs were designed to ensure protection of human health by restricting future site use and accessibility, educating NAS Key West personnel, and maintaining records of contamination. The LUCIP for SWMU 5 includes the placement and maintenance of signs around the site perimeter, which state that trespassing and dumping are not permitted at the site. Personnel from the NAS Key West Public Works Department are required to visually inspect SWMU 5 at least

once every three months to ensure that LUCs are being implemented and signs are properly maintained. The NAS Key West Public Works Department submits an annual report to FDEP describing the results of the quarterly inspections.

The SOB prescribed that groundwater, surface water, and sediment samples to be collected quarterly for the first year and annually thereafter for nine years to determine the need of any future action. The quarterly monitoring began in April 2000 and was completed in January 2001. Groundwater monitoring was eliminated following the first year of monitoring because inorganic detections were consistently below action levels (TtNUS, 2001a). Sediment and surface water are currently being monitored annually.

In November 2006, a storm surge investigation was initiated to determine if the storm surge from Hurricane Wilma in October 2005 had caused significant contaminant migration. Surface soil, sediment, and surface water samples were collected in November 2006 and evaluated with results from annual monitoring to assess the effectiveness of the site remedy. While arsenic was detected in surface soil above its action level, investigation results suggested that the contamination in soil was not moving into the downgradient pond and lagoon. The surface water and sediment data also indicated that the storm surge had not caused migration of contamination at SWMU 5. Therefore, the site boundaries were not adjusted as a result of the storm surge investigation. TtNUS did recommend that the performance monitoring program be scaled back to only include the pond in future sampling events, as the data suggested potential risk (if any) posed by metals and pesticides was limited to this area (TtNUS, 2010a).

3.4.3.3 Sampling since the Last Five-Year Review

Five annual sampling events involving the monitoring of surface water and sediment have been conducted since the previous five-year review in July 2010; these events were conducted in January 2010 (OHC, 2010), December 2011 (ECS, 2012), December 2012 (ECS, 2013), December 2013 (Battelle, 2015), and December 2014.

3.4.4 Five-Year Review Process

3.4.4.1 Document Review

Reports and data from monitoring and investigations conducted from 2010 through 2013 were reviewed for this corrective action effectiveness evaluation. The most recent available data report reviewed for this corrective action effectiveness evaluation is the 2013 APM Report (Battelle, 2015). Tables 1 through 33 of the 2013 APM Report present information on optimization of monitoring analyte suites as well as compilations of historical data for the APM sites. These tables are included for reference as Appendix A to this report.

The 2012 APM report set forth the decision rules adopted by the NAS Key West Partnering Team for optimizing the sampling program. Appendix A, Table 3 contains the APM optimization rules defined by the Partnering Team. Appendix A, Table 4 highlights the APM optimization summary and provides a list of the analytes that qualified to be removed from the APM program based on the decision rules.

3.4.4.2 Data Review and Evaluation

The SOB did not identify any surface water COCs or ECCs for SWMU 5 (TtNUS, 1999g). Sediment COCs are arsenic, beryllium, and chromium. There are no sediment ECCs identified in the SOB (TtNUS, 1999g). The APM program required collection of surface water and sediment samples at SWMU 5 per the PMP (TtNUS, 2000c), PMP Addendum (Battelle, 2012a) and the Sampling and Analysis Plan Addendum 1 (Battelle, 2012b). Discussion of non-COC surface water sampling and analysis is presented in Section 3.4.9. No sediment COCs were detected in 2013. Discussion of non-COC sediment sample analysis is presented in Section 3.4.9.2.

3.4.4.3 Site Inspection and Interviews

LUCs are inspected quarterly, and an annual report is prepared and submitted to FDEP. Selected annual LUC compliance reports were reviewed for this five-year review. In addition, a specific site inspection, including interviews, was conducted for the five-year review. Information was recorded on site inspection/interview forms that are presented in Appendix C. No significant issues have been identified. Since access to the site is restricted, trespassing is minimal. In addition, warning signs are in place along the unfenced portion of the site perimeter, notifying base personnel that SWMU 5 is restricted.

3.4.5 Technical Assessment

The technical assessment is focused on three primary questions, each of which is presented below.

3.4.5.1 Question A

Is the remedy functioning as intended by the decision documents?

The remedy is functioning as intended to protect human health and the environment. SWMU 5 is located on an active military base, and access is restricted. NAS Key West personnel perform quarterly visual inspections to ensure maintenance of LUCs and report annually to FDEP. Annual monitoring of surface water and sediment is conducted and is reported to FDEP. In addition, warning signs are in place around the unfenced portion of the site perimeter notifying base personnel that access to SWMU 5 is restricted.

3.4.5.2 Question B

Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy selection still valid?

There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. There has been no change to the standardized risk assessment methodology or toxicity data that could affect the protectiveness of the remedy. Florida CTLs have been updated since the time of the SOB (TtNUS, 1999g). Toxicity data for selected individual contaminants have also been updated; however, these updates do not affect the protectiveness of the remedy because LUCs limit exposure to human receptors. The baseline ERA concluded that ecological risk was low. The SOB recommended that LUCs be selected as the remedy to prevent exposure to human receptors. Updated CTLs and toxicity criteria would not change this condition. The RAOs remain valid.

3.4.5.3 Question C

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

No new ecological receptors or human usage of the site were identified during performance monitoring or during the five-year period. This Five-Year Review did not identify any other information that calls into question the protectiveness of the remedy.

3.4.5.4 Technical Assessment Summary

Based on the data reviewed and the site inspections, the remedy is functioning as intended by the SOB and HSWA permit. As discussed, there have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. There have been no significant changes to the standardized risk assessment methodology that could affect the protectiveness of the remedy. Florida CTLs have been updated since the current (2013) project action levels were determined. Toxicity data for selected individual contaminants have also been updated; however, these updates do not affect the protectiveness of the remedy because LUCs limit exposure to human receptors. The baseline ERA concluded that ecological risk was low. The SOB recommended that LUCs be selected as the remedy to prevent exposure to human receptors. Updated CTLs and toxicity criteria would not change this condition. There is no other information that calls into question the protectiveness of the remedy.

3.4.6 Issues

This five-year review did not identify any issues that could impact the remedy.

3.4.7 Recommendations and Follow-up Actions

The findings of this corrective action effectiveness evaluation support the following recommendations:

- LUCs should remain in place at the site.
- Surface water and sediment sampling should be reduced to a quinquennial frequency to support future five year reviews because LUCs prevent human contact with COCs, there are no surface water COCs or ECCs, and because sediment COCs are not detected and there are no sediments ECCs.
- The NAS Key West Partnering Team should develop timelines for implementing these recommendations.

3.4.8 Protectiveness Statement

The remedy is protective of human health and the environment.

3.4.9 Supplemental Information

The SOB did not identify any surface water COCs or ECCs for SWMU 5 (TtNUS, 1999g). Sediment COCs are arsenic, beryllium, and chromium. The APM program required collection of surface water and sediment samples at SWMU 5 per the PMP (TtNUS, 2000c), PMP Addendum (Battelle, 2012a) and the Sampling and Analysis Plan Addendum 1 (Battelle, 2012b). Discussion of non-COC surface water sampling and analysis is presented below.

3.4.9.1 Surface Water

In 2013, surface water samples were collected from three locations (S5SW01 through S5SW03) at SWMU 5 (Figure 3-10) and analyzed for metals. Detections within each analytical suite are discussed below.

Metals. Surface water samples from all three locations (S5SW01, S5SW02 and S5SW03) were analyzed for a reduced list of TAL metals, as well as tin. Two metals were detected (iron and mercury). No metals exceeded their respective surface water action levels (Figure 3-11 and Appendix A, Table 21).

It should be noted that current (2014) surface water CTLs in FAC Chapter 62-777 have been updated. These updates result in increases or decreases to specific CTLs that cause them to differ from the current project action levels for surface water. Appendix B presents a comparison of 2014 groundwater CTLs with the project action levels.

3.4.9.2 Sediment

In 2013, sediment samples were collected from two locations (S5SD01 and S5SD02) at SWMU 5 (Figure 3-10) and analyzed for metals. Sediment samples from both locations (S5SD01 and S5SD02) were analyzed for a reduced list of TAL metals, as well as tin. Three of the seven metals analyzed (cadmium, cobalt, vanadium) were detected, and one metal (cobalt) exceeded its sediment action level in both samples (Figure 3-11 and Appendix A, Table 22).

SQAGs, referenced in FAC Chapter 62-777, are used as the primary screening criteria. The SQAGs have not been formally revised since their original publication in 1994, but toxicity values for individual contaminants on which the SQAGs are based have been revised.

3.4.10 Next Review

The next corrective action effectiveness evaluation for SWMU 5 is due to be completed five years following the signature date of this report.

3.5 SWMU 7 – BOCA CHICA TEMPORARY HAZARDOUS WASTE STORAGE AREA

This section describes the corrective action effectiveness evaluation for SWMU 7, the Boca Chica Temporary Hazardous Waste Storage Area.

3.5.1 History and Site Chronology

A list of important SWMU 7 historical events and relevant dates in the site chronology is shown below. The identified events are intended to be illustrative, rather than comprehensive.

Date	Event or Activity
April 1988	VSI conducted by EPA as documented in the RFA Report
March 1991	Investigation and clean-up by Blasland, Bouck, and Lee, Inc. (BBL)
June 1994	RFI/RI Report issued by IT
November 1995	Delineation Sampling Report produced by BEI
October 1995	IRA excavation completed by BEI
January 1998	Supplemental RFI/RI Report for eight sites produced by B&RE
March 1999	CMS Report for SWMU 7 issued by TtNUS
February 1999	SOB for SWMU 7 issued by TtNUS

April 2000	First year of quarterly performance monitoring implemented by TtNUS
January 2002	APM conducted by TtNUS
January 2003	APM conducted by TtNUS
July 2003	RCRA CAMP (Rev. 4) produced by TtNUS
January 2004	APM conducted by REA Remedial Solutions
December 2004	First Five-Year Review conducted by TtNUS
February 2005	APM conducted by REA Remedial Solutions
February 2006	APM conducted by REA Remedial Solutions
January 2007	APM conducted by REA Remedial Solutions
January 2008	APM conducted by REA Remedial Solutions
January 2009	APM conducted by OHC Environmental Engineering
April 2010	APM conducted by OHC Environmental Engineering *
July 2010	Second Five-Year Review conducted by TtNUS
December 2011	APM conducted by ECS*
December 2012	APM conducted by ECS*
December 2013	APM conducted by Battelle*
December 2014	APM conducted by Battelle

*Represents sample data covered by this corrective action effectiveness evaluation.

3.5.2 Background

3.5.2.1 Site Description

SWMU 7, the Boca Chica Temporary Hazardous Waste Storage Area, Building A-824, is located in the northern portion of Boca Chica Key, just north of U.S. Highway 1 (Figure 3-12). SWMU 7 consists of Building A-824 and a grassy area enclosed by a chain-link fence that surrounds the building. Small ponds lie to the north and south of the site. The northern pond is approximately 30 feet by 30 feet and 3 to 4 feet deep. The southern pond, approximately 150 feet south of Building A-824, is approximately 15 feet by 20 feet and 2 feet deep. An 18-inch wide by 18-inch deep ditch extends from the northern pond to the southern pond, with a branch to the southwest at a point approximately midway between these two small ponds and terminating near a site perimeter road (Figure 3-12). The sediment in the ditch consists of material eroded from the limestone and fill material present at the site. Material used as fill at the site is from Boca Chica Channel, Key West Harbor, or Flagler Railroad. Water in the ditch consists of runoff from the site and overflow from the northern pond (B&RE, 1998a). The building is used for the storage of various sized empty waste collection drums and spill response equipment as well as storage for the following wastes: used oils, used antifreeze/coolants, used gasoline, universal wastes (batteries, whole and crushed fluorescent lamps), and hazardous waste aerosol residues.

Navy records and interviews conducted indicate that Building A-824 was used in the past to store supplies and small electrical transformers, and served as a temporary staging area for 55-gallon drums of hazardous waste (IT, 1994). Base personnel indicated that transformer oil was occasionally dumped on the ground immediately north of Building A-824 (B&RE, 1998a).

3.5.2.2 Summary of Sampling Results

In 1991, BBL collected samples from sandbags stacked near Building A-824, soils around the building, and the floor of the building. After sampling, BBL performed a series of clean-up activities of the structure and surrounding area in March 1991 (B&RE, 1998a).

IT conducted soil, sediment, surface water, and groundwater sampling during the RFI/RI at SWMU 7 in 1993. Metals and hydrocarbons were detected in soils around the building. In addition, PCBs, pesticides, and metals were detected in sediment from the ditch to the west of the building. The RFI/RI Report recommended additional surface water and sediment sampling to delineate the extent of contamination, receptor identification to determine if ecological risks exist, and that a human health risk assessment be conducted (IT, 1994).

3.5.2.3 1995 Interim Remedial Action

Following the RFI/RI, delineation sampling was performed by BEI in August 1995 to delineate PCB contamination in soil. The Remediation Work Plan for the contaminated soil was prepared in 1995 (BEI, 1995b). The IRA began August 1995 and was completed in October of that year. Approximately 26 cubic yards of soil were removed and disposed off-site. Confirmation sampling of soil was performed to determine the effectiveness of the removal. PCBs were left in place at the northern fence line near the pond, as well as at the building foundation. The excavation was backfilled with 39 tons of crushed stone to match the existing grade (BEI, 1998).

3.5.2.4 Summary of Risk

Following the IRA, B&RE performed the Supplemental RFI/RI for eight sites, including human health and ecological risk assessments. The HHRA identified risks to hypothetical future residents, trespassers, and occupational workers, the Supplemental RFI/RI recommended preparation of a CMS for SWMU 7 (B&RE, 1998a). The ERA concluded that the detected contaminants do not pose significant environmental risks at SWMU 7. The aquatic habitat at the site is limited, resulting in minimal use of the site and the vicinity by aquatic receptors. Overall potential risk to aquatic and terrestrial receptors appeared to be low. Therefore, there were no ECCs established in the ERA.

Based on the HHRA and ERA, site COCs and ECCs, and their respective media at SWMU 7 are summarized as follows:

Exposure Medium	COC for Human Health Risk	ECC for Ecological Risk
Soil	arsenic antimony beryllium Aroclor 1260	none
Groundwater	none	none
Surface Water	antimony beryllium	none
Sediment	arsenic benzo(b)fluoranthene Aroclor 1260	none

3.5.3 Remedial Actions

3.5.3.1 Remedy Selection

The CMS determined that the appropriate remedy for SWMU 7 was ICs, consisting of LUCs with monitoring (TtNUS, 1999h). The LUCs were designed to eliminate or reduce exposure pathways

by limiting site access. Additional information regarding the selection of LUCs with monitoring as a remedy for SWMU 7 is provided in the CMS and summarized in the SOB for SWMU 7 (TtNUS, 1999i).

The RAO for SWMU 7 is not explicitly stated in the SOB, but can be reasonably inferred from the results of the baseline HHRA, ERA, and from the risk management decisions described in the SOB, as follows:

- Prevent contact between human receptors and site COCs.

3.5.3.2 Remedy Implementation

LUCs were developed by the NAS Key West Partnering Team and implemented through LUCIPs. These controls were designed to ensure protection of human health by restricting future site use and accessibility, educating NAS Key West personnel, and maintaining records of contamination. The LUCIP for SWMU 7 includes the placement and maintenance of signs around the perimeter which state that dumping and trespassing are not permitted at the site. Personnel from the NAS Key West Public Works Department are required to visually inspect SWMU 7 at least once every three months to ensure that all LUCs are being implemented and signs are properly maintained. The NAS Key West Public Works Department submits an annual report to FDEP describing the results of the quarterly inspections.

The SOB prescribed that groundwater, surface water, and sediment samples to be collected quarterly for the first year and annually thereafter for nine years to evaluate the effectiveness of the IRA and determine if additional remedial action is warranted. The quarterly groundwater monitoring began in April 2000 and was completed in January 2001 (TtNUS, 2001a). Groundwater monitoring was eliminated following the first year of monitoring because inorganic detections were consistently below action levels (TtNUS, 2001a). Sediment and surface water are currently being monitored annually.

3.5.3.3 Sampling since the Last Five-Year Review

Four annual sampling events involving the monitoring of surface water and sediment have been conducted since the previous five-year review in July 2010; these events were conducted in January 2010 (OHC, 2010), December 2011 (ECS, 2012), December 2012 (ECS, 2013), December 2013 (Battelle, 2015), and December 2014.

3.5.4 Five-Year Review Process

3.5.4.1 Document Review

Reports and data from monitoring and investigations conducted from 2010 through 2013 were reviewed for this corrective action effectiveness evaluation. The most recent available data report reviewed for this corrective action effectiveness evaluation is the 2013 APM Report (Battelle, 2015). Tables 1 through 33 of the 2013 APM Report present information on optimization of monitoring analyte suites as well as compilations of historical data for the APM sites. These tables are included for reference as Appendix A to this report.

The 2012 APM report set forth the decision rules adopted by the NAS Key West Partnering Team in 2012 for optimizing the sampling program. Appendix A, Table 3 contains the APM optimization

rules defined by the Partnering Team. Appendix A, Table 4 highlights the APM optimization summary and provides a list of the analytes that qualified to be removed from the APM program based on the decision rules.

3.5.4.2 Data Review and Evaluation

As explained in Section 3.5.3.2, groundwater monitoring was eliminated following the first year of monitoring. Surface soil data were summarized and reviewed in the first five-year review (TtNUS, 2004a). However, since surface soil sampling is not part of the long-term monitoring plan for SWMU 7, no new surface soil data have been generated since the last review.

The SOB identified surface water COCs as antimony and beryllium (TtNUS, 1999i). The SOB did not identify any surface water ECCs. Sediment COCs were identified as Aroclor 1260, arsenic, and benzo(b)fluoranthene. No sediment ECCs were identified.

The APM program required collection of surface water and sediment samples at SWMU 7 per the PMP (TtNUS, 2000c), PMP Addendum (Battelle, 2012a) and the Sampling and Analysis Plan Addendum 1 (Battelle, 2012b). In 2013, no surface water COCs were detected, Discussion of non-COC surface water sample analysis is presented in Section 3.5.9. In 2013, the sediment COCs arsenic and Aroclor-1260 were not detected in any samples. The sediment COC benzo(b)fluoranthene was detected below the action level in one sediment sample – S7SD-06 (Figure 3-15). Non-COC sediment sample analysis is discussed in Section 3.5.9.2.

3.5.4.3 Site Inspection and Interviews

LUCs are inspected quarterly, and an annual report is prepared and submitted to FDEP. Selected annual LUC compliance reports were reviewed for this five-year review. In addition, a specific site inspection, including interviews, was conducted for the five-year review. Information was recorded on site inspection/interview forms that are presented in Appendix C. No significant issues have been identified. Since access to the site is restricted, trespassing is minimal. In addition, warning signs are in place around the site perimeter, notifying base personnel that access to SWMU 7 is restricted.

3.5.5 Technical Assessment

The technical assessment is focused on three primary questions, each of which is presented below.

3.5.5.1 Question A

Is the remedy functioning as intended by the decision documents?

The remedy is functioning as intended, protecting human health. SWMU 7 is located on an active military base, and access to the base is restricted. NAS Key West personnel perform quarterly visual inspections to ensure adherence to LUCs, and an annual report is submitted to FDEP describing the results of the quarterly inspections. Annual monitoring of surface water and sediment is conducted and is reported to FDEP. In addition, warning signs are in place around the site perimeter, reducing the likelihood of trespassing and exposure to contaminated media. There is no planned change in site usage for the foreseeable future.

3.5.5.2 Question B

Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy selection still valid?

There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. There has been no change to the standardized risk assessment methodology or toxicity data that could affect the protectiveness of the remedy. Florida CTLs have been updated since the time of the SOB (TtNUS, 1999i). Toxicity data for selected individual contaminants have also been updated; however, these updates do not affect the protectiveness of the remedy because LUCs limit exposure to human receptors. The ERA concluded that ecological risk was low (B&RE, 1998a). The SOB recommended that LUCs be selected as the remedy to prevent exposure to human receptors. Updated CTLs and toxicity criteria would not change this condition. The RAOs remain valid.

3.5.5.3 Question C

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

No new ecological receptors or human usage of the site were identified during performance monitoring or during the five-year period. No weather related events have affected the protectiveness of the remedy.

This five-year review has not identified any other information that calls into question the protectiveness of the remedy.

3.5.5.4 Technical Assessment Summary

Based on the data reviewed and the site inspections, the remedy is functioning as intended by the SOB and HSWA permit. There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. There have been no significant changes to the standardized risk assessment methodology that could affect the protectiveness of the remedy. Florida CTLs have been updated since the time of the SOB (TtNUS, 1999i). Toxicity data for selected individual contaminants have also been updated; however, these updates do not affect the protectiveness of the remedy because LUCs limit exposure to human receptors. The baseline ERA concluded that ecological risk was low. The SOB recommended that LUCs be selected as the remedy to prevent exposure to human receptors. Updated CTLs and toxicity criteria would not change this condition.

3.5.6 Issues

This five-year review did not identify any issues that could impact the remedy.

3.5.7 Recommendations and Follow-up Actions

The findings of this corrective action effectiveness evaluation support the following recommendations:

- LUCs should remain in place at the site.

- Surface water and sediment sampling should be reduced to a quinquennial frequency to support future five year reviews because LUCs prevent contact with human receptors, and because there are no surface water or sediment ECCs.
- The NAS Key West Partnering Team should develop timelines for implementing these recommendations.

3.5.8 Protectiveness Statement

The remedy is protective of human health and the environment.

3.5.9 Supplemental Information

The APM program required collection of surface water and sediment samples at SWMU 7 per the PMP (TtNUS, 2000c), PMP Addendum (Battelle, 2012a) and the Sampling and Analysis Plan Addendum 1 (Battelle, 2012b). In 2013, no surface water COCs were detected, Discussion of non-COC surface water sample analysis is presented in Section 3.5.9.1 below. In 2013, the sediment COCs arsenic and Aroclor-1260 were not detected in any samples. Non-COC sediment sample analysis is discussed below in Section 3.5.9.2.

3.5.9.1 Surface Water

Surface water samples were collected from three locations (S7SW05, S7SW06 and S7SW08) at SWMU 7 (Figure 3-12) and analyzed for metals, pesticides and PCBs. Detections within each analytical suite are discussed below.

Metals. Surface water samples from all three locations (S7SW05, S7SW06 and S7SW08) were analyzed for a reduced list of TAL metals, as well as tin. Two metals were detected (copper and manganese) in one or more samples. Copper and manganese in all three locations exceeded the respective surface water action levels (Figure 3-13 and Appendix A, Table 23).

Pesticides. Surface water samples from all three locations (S7SW05, S7SW06 and S7SW08) were analyzed for a reduced list of Appendix IX pesticides. No pesticides were detected (Figure 3-13 and Appendix A, Table 24).

PCBs. Surface water samples from two locations (S7SW05 and S7SW06) were analyzed for a reduced list of Appendix IX PCBs. No PCBs were detected (Figure 3-13 and Appendix A, Table 24).

It should be noted that current (2014) surface water CTLs in FAC Chapter 62-777 have been updated. These updates result in increases or decreases to specific CTLs that cause them to differ from the current project action levels for surface water. Appendix B presents a comparison of 2014 groundwater CTLs with the project action levels.

3.5.9.2 Sediment

Sediment samples were collected from three locations (S7SD05, S7SD06 and S7SD08) at SWMU 7 (Figure 3-12) and analyzed for metals, PAHs, pesticides and PCBs. Detections within each analytical suite are discussed below.

Metals. Sediment samples from all three locations (S7SD05, S7SD06 and S7SD08) were analyzed for a reduced list of TAL metals, as well as tin. All metals analyzed were detected in

one or more samples with 11 of 13 metals exceeding sediment action levels in one or more samples (Figure 3-14 and Appendix A, Table 25).

Pesticides. Sediment samples from all three locations (S7SD05, S7SD06 and S7SD08) were analyzed for a reduced list of Appendix IX pesticides. Of the pesticides only four analytes were detected (i.e., DDD, DDE, DDT, and dieldrin), and each detected analyte exceeded the sediment action level in one or more samples (Figure 3-15 and Appendix A, Table 27).

PCBs. Sediment samples from two locations (S7SD05 and S7SD06) were analyzed for a reduced list of Appendix IX PCBs. No PCBs were detected (Figure 3-15 and Appendix A, Table 27).

SQAGs, referenced in FAC Chapter 62-777, are used as the primary screening criteria. The SQAGs have not been formally revised since their original publication in 1994, but toxicity values for individual contaminants on which the SQAGs are based have been revised. Furthermore, SQAGs are screening criteria for ecological receptors. The ERA (B&RE, 1998a) concluded that the detected contaminants do not pose significant environmental risks at SWMU 7, and the remedy for SWMU 7 has been to mitigate risk to human health. Since the RAO for SWMU 7 is protection of human receptors, the use of SQAGs should be reconsidered.

3.5.10 Next Review

The next corrective action effectiveness evaluation for SWMU 7 is due to be completed five years following the signature date of this report.

3.6 SWMU 9 – BOCA CHICA JET ENGINE TEST CELL

This section describes the corrective action effectiveness evaluation for SWMU 9, the Boca Chica Jet Engine Test Cell.

3.6.1 History and Site Chronology

A list of important SWMU 9 historical events and relevant dates in the site chronology is shown below. The identified events are intended to be illustrative, rather than comprehensive.

Date	Event or Activity
1969 to 1995	SWMU 9 used for testing repaired jet engines
1987 to 1995	5,000-gallon AST used to fuel engines with JP-5 Fuel
January 1989	Filter system leak spills 700 gallons of JP-5 Fuel
January - February 1989	Initial Remedial Action
November 1992	Overturned lube oil drum discovered by ABB Environmental Services, Inc. (ABB)
June 1994	Contamination Assessment Report issued by ABB
May 1995	Remediation Work Plan for Delivery Order No. 0004 issued by BEI
July 1996 – June 1997	Pump and treatment system operated by BEI
July 1997	Supplemental RFI/RI Report for high-priority sites issued by B&RE
August 1999	Natural attenuation study results produced by TtNUS
October 1999	Corrective Measures Study Report produced by TtNUS
February 2000	SOB issued by TtNUS

April 2000	Baseline groundwater evaluation to support the Treatability Study performed by TtNUS
January 2001	ORC® and Hydrogen Release Compound (HRC®) injection performed by TtNUS
July 2001	Treatability study quarterly monitoring implemented by TtNUS
March 2002	Pump and treat remediation system removed by CCI
January 2003	Annual groundwater sampling event performed by TtNUS
July 2003	RCRA CAMP (Rev. 4) issued by TtNUS
December 2004	First five-year review conducted by TtNUS
November 2008	Groundwater baseline sampling
February 2009	Field demonstration consisting of sampling interstitial pore water in lagoon sediments by TtNUS
December 2009	UFP SAP for SWMU 9 and the Boca Chica Flying Club including November 2008 monitored natural attenuation assessment for SWMU 9 issued by TtNUS
July 2010	Second five-year review conducted by TtNUS
August – December 2010	Installation of two additional monitoring wells (S9MW26 and S9MW27) and monitored natural attenuation evaluation by TtNUS
July 2013	Partnering Team outlined path forward utilizing alternative groundwater cleanup target levels (GCTLs), specifically marine surface water contaminant target levels
August 2014	Final Groundwater Monitoring Report issued by Battelle

3.6.2 Background

3.6.2.1 Site Description

SWMU 9, the former Jet Engine Test Cell site, is located in the eastern portion of the Boca Chica airfield between a taxiway and inlet (Figure 3-16). The 0.5-acre site is relatively flat with grass and scrub brush cover. An inlet of Florida Bay is located north of the site and a narrow strip of red mangroves is located along the shoreline of the inlet. The site has been identified as Lower Keys marsh rabbit habitat. Beginning in 1969, SWMU 9 was used for testing repaired jet engines. These engines were fueled with JP-5 from a bermed 5,000-gallon AST from 1987 through 1995. Organic solvents, ketones and trichloroethene (TCE), were reportedly used to clean jet engines and the engine test areas. When it was in use, the facility included a cradle for securing jet engines, a concrete pad, jet blast deflectors, ASTs storing jet fuel, and a storage shed (formerly an approved hazardous waste storage site). Engine testing activities were suspended in 1995 and most of the equipment was removed at that time. No other known activities have been conducted at the site (B&RE, 1997).

Two documented spills occurred at the former Jet Engine Test Cell. In January 1989, a fuel filter system leak resulted in the release of approximately 700 gallons of JP-5 fuel. Approximately 600 gallons were recovered by pumping free product during initial remediation activities. Following free product recovery, 10 cubic yards of contaminated soil were excavated and removed from the spill site. The second spill, in November 1992, involved an overturned lubrication oil drum. Stained soil was observed in a small area. Contamination from this spill was presumably removed shortly after its discovery (B&RE, 1997).

3.6.2.2 Summary of Sampling Results

Fuels, oils, and solvents stored at SWMU 9 prior to 1995 are potential sources of contamination.

Chlorinated VOCs have been the most frequently detected groundwater contaminants, although they are not components of jet fuel. No documentation of solvent spills exists; however, the chlorinated VOCs most likely came from solvents used for cleaning and degreasing at the site (B&RE, 1997). During the site investigation of the fuel spill, groundwater was found to be contaminated by chlorinated solvents. Several investigations have been conducted at SWMU 9 since 1993. Sampling events in 1993, 1994, 1995, and 1996 were performed to characterize constituent types and distributions. Groundwater contaminant plumes of benzene and 1,2-dichloroethene (DCE) were identified. Benzene, toluene, ethylbenzene, and xylenes (collectively known as BTEX), naphthalene, total recoverable petroleum hydrocarbons (TRPH), and several chlorinated VOCs were detected in the groundwater samples. TRPH and total naphthalene concentrations exceeded Florida Groundwater Standards in the vicinity of the jet engine testing pad, while concentrations of 1,2-DCE and TCE exceeded their respective maximum contaminant levels in the vicinity of the storage shed. Low concentrations of these same VOC and SVOC contaminants were found in soil, but metals and inorganics were the primary soil contaminants. Surface water and sediment contaminants at the shoreline on the northern edge of the site were also predominantly metals and inorganics.

3.6.2.3 1996 Interim Remedial Action

A pump and treat groundwater remediation system was installed at SWMU 9 in 1996 to recover and treat groundwater impacted by chlorinated solvents. The pump and treat system was terminated following one year of operation due to poor recovery of free product. The remediation system was removed in 2002 and site restoration activities were conducted in March 2003 (TtNUS, 2010a).

3.6.2.4 Summary of Risk

Due to borderline human health risks posed by contamination at the site, a CMS was recommended in the Supplemental RFI/RI for high-priority sites (B&RE, 1997).

The estimated carcinogenic risks for future residents, adult trespassers, and adolescent trespassers were found to be within EPA's target risk range of 10^{-4} to 10^{-6}. The estimated carcinogenic risks for other use scenarios were well below the EPA target risk range. The non-carcinogenic hazard index for future residents exceeded the threshold of 1.

The ERA concluded that ecological risks to terrestrial receptors posed by surface contaminants at the site were negligible due to the limited extent of contaminants in the soil. Migration of groundwater contaminants to the nearby inlet had not occurred based on benthic monitoring, but the potential for ecological risks from the contaminant migration to surface water and sediment exists (B&RE, 1997).

Based on the HHRA and ERA, site COCs and ECCs, and their respective media at SWMU 9 are summarized as follows:

Exposure Medium	COC for Human Health Risk	ECC for Ecological Risk
Soil	none	none
Groundwater	none	cis-1,2-dichloroethene

		trans-1,2-dichloroethene trichloroethene benzene
Surface Water	none	none
Sediment	none	none

3.6.3 Remedial Actions

3.6.3.1 Remedy Selection

The CMS determined that the appropriate remedy for SWMU 9 was enhanced biodegradation with long-term monitoring. The remedy employed injection of both ORC® and HRC® to enhance the performance of naturally occurring microbes in biodegrading the contaminants in the groundwater (TtNUS, 1999b). The remedy is summarized in the SOB for SWMU 9 (TtNUS, 2000f).

RAOs for SWMU 9 are not explicitly stated in the SOB, but can be reasonably inferred from the results of the baseline HHRA, ERA, and the CMS, as follows:

- Prevent the migration of groundwater contaminants to the adjacent lagoon to protect ecological receptors. Remedy implementation

Groundwater sampling was performed in April 2000 to determine ORC® and HRC® injection amounts and locations. Chemicals analyzed during this event included VOCs, VOC degradation products (ethene, ethane, methane, carbon dioxide, and hydrogen), and geochemical parameters (dissolved oxygen [DO], alkalinity, sulfate, sulfide, hydrogen sulfide, and oxidation/reduction potential [ORP]) (TtNUS, 2000g).

A treatability study targeted the source areas of two groundwater contaminant plumes for enhanced biodegradation. The target for the ORC® injection was the petroleum hydrocarbon plume defined by historically elevated concentrations of dissolved benzene. The target for the HRC® injection was the source area for the chlorinated solvents plume, defined by elevated concentrations of cis- and trans-1,2-DCE. ORC® and HRC® injection activities occurred in January 2001. The treatability study focused on two objectives. The first objective was to determine the effectiveness of ORC® at reducing contaminant concentrations within the petroleum-contaminated source area. This relied on the release of DO to increase microbial activity, thereby increasing contaminant reduction through aerobic respiration (TtNUS, 2000g). Approximately 330 pounds of ORC® were injected into the subsurface at SWMU 9 using direct-push technology (TtNUS, 2001c).

The second objective of the treatability study was to determine the effectiveness of HRC® at reducing contaminant concentrations within the solvent-contaminated source area. This strategy relied on increasing dissolved hydrogen concentrations to increase the reductive microbial activity, thereby decreasing contaminant concentrations through reductive dechlorination (TtNUS, 2000g). Approximately 3,660 pounds of HRC® were injected into groundwater in different locations at SWMU 9. Following injection of ORC® and HRC®, one monitoring event of

groundwater was conducted (TtNUS, 2001c). Groundwater was then sampled in January 2003 as part of the annual groundwater program.

In November 2008, an investigation was conducted to determine if the site was still suitable for monitored natural attenuation as a long-term remediation strategy. The monitored natural attenuation evaluation indicated that biological degradation was occurring at the site and that physical and/or chemical processes (direct oxidation or mineralization) were occurring for all contaminants present above GCTLs. However, the persistence of 1,2-DCE degradation products (e.g., vinyl chloride), and the apparent potential for plume migration required additional evaluation and delineation.

In February 2009, a field demonstration consisting of sampling the interstitial pore water in sediment was conducted in lagoon sediments to the north of the site. Site COCs were not detected in sediment pore water or co-located deep surface water of the lagoon, indicating that contaminant migration had not penetrated into the lagoon. Further delineation and characterization of groundwater contamination occurred in August and December 2010, when TtNUS installed two groundwater monitoring wells (S9MW26 and S9MW27 on Figure 3-6) along the northern site boundary, and collected groundwater samples for MNA parameters, VOCs, and water quality analyses. The 2010 MNA evaluation (TtNUS, 2011) concluded:

- COCs at the site were spatially delineated with residual contamination bound to the shallow portion of the aquifer.
- 1,2-DCE migration to the north of the site was a result of HRC® injections displacing the contaminants rather than natural migration.
- Natural attenuation of site COCs continues across the site.
- Chemical concentration data for cis-1,2-dichloroethene (cDCE), trans-1,2-dichloroethene (tDCE), vinyl chloride, and chloromethane were below marine surface water contaminant target levels as identified in Chapter 62-777 F.A.C. Table I.
- Additional pore water sampling is not necessary because of the addition of the two new perimeter monitoring wells (S9MW-26, and -27) located downgradient of the site and immediately upgradient of the lagoon.
- Chemical concentration data for site COCs for all wells were below the natural attenuation default concentrations, with the exception of S9MW-21, which exceeded the criteria for cDCE and tDCE.
- Only monitoring well S9MW-5 exceeded the GCTLs for benzene at the site.
- Monitored natural attenuation remained an appropriate remedy for SWMU 9.

The 2010 monitored natural attenuation evaluation recommended one additional round of monitoring from the two new perimeter wells, followed by a transition of the site to long-term monitoring of wells S9MW-5, -14, -21, -22, -24, -25, -26, and -27 for benzene, cDCE, tDCE, vinyl chloride, and chloromethane.

Partnering Team discussions in July 2013 outlined a path forward for SWMU 9, which included utilization of alternative GCTLs, specifically marine surface water cleanup target levels, since the "groundwater contamination may potentially affect only a marine surface water body with no other properties or fresh surface water body" as stated in Chapter 62-780, F.A.C. As a result, one additional round of monitoring was outlined in the Draft Sampling and Analysis Plan (Battelle, 2013) to satisfy the regulatory requirements of monitoring the new sentinel wells (S9MW-26 and -27) for a minimum of one year, and confirm that the site COCs continue to meet marine surface water contaminant target levels established in Chapter 62-777 F.A.C. Table I.

3.6.3.2 2011-2014 Airfield Restoration Project

An airfield restoration project began construction in October 2011 to restore airfield clear zones and improve the stormwater drainage systems at Boca Chica Field. Activities near SWMU 9 included clearance of mangrove along the north side of the site adjacent to the lagoon to maintain the required clear zone of the nearby taxiway and flight line. No site media (soil, sediment, surface water or groundwater) within the LUC boundary of the site were disturbed. To avoid adverse impacts to the Lower Keys marsh rabbit habitat at SWMU 9, all mangrove removal activities were performed by hand (i.e., no heavy earth moving equipment).

3.6.4 Five-Year Review Process

3.6.4.1 Document Review

Groundwater sampling and monitoring events since the previous five-year review report (TtNUS, 2010a) are documented in the Final Groundwater Monitoring Report, Solid Waste Management Unit 9, Naval Air Station Key West, Key West, Florida (Battelle, 2014). All groundwater data were reviewed and evaluated for this five-year review. Selected groundwater data for the December 2013 sampling event are illustrated on Figure 3-17.

3.6.4.2 Data Review and Evaluation

Groundwater is the only medium of concern at SWMU 9. According to the SOB, no human health COCs were retained for remedial clean-up goal option analysis in the CMS because in no instance did any receptor scenario have a total risk (combined across pathways) exceeding a level of concern (1×10^{-4} incremental cancer risk or HI of 1.0) (TtNUS, 2000f). Groundwater ECCs consist of benzene, cDCE, tDCE, and TCE.

Selected results from the December 2013 event are shown on Figure 3-17. Of the COCs assessed, only benzene, and total 1,2-DCE (cDCE plus tDCE), and vinyl chloride (not a site COC) were detected in site wells in December 2013. All three compounds exceeded their respective FDEP GCTLs in one or more monitoring wells. Benzene was observed only once, in a duplicate sample collected from monitoring well S9MW-05 at a concentration of 1.2 µg/L, exceeding the GCTL of 1 µg/L. Total 1,2-DCE was detected in six wells with concentrations in three wells (S9MW-21, -22, and -24) exceeding the GCTL of 63 µg/L. Vinyl chloride was detected in one well (S9MW-22) at a concentration of 73 µg/L, exceeding the GCTL of 1 µg/L. Concentrations of COCs in site boundary wells were all below GCTLs.

Based on these findings, the Final Groundwater Monitoring Report (Battelle, 2014) presented the following conclusions:

1. The contaminant plumes (i.e., benzene and chlorinated VOC plumes) at SWMU 9 have been fully delineated to concentrations below FDEP GCTLs.
2. Recently installed (December 2010) site boundary monitoring wells S9MW-26 and -27 have shown COC concentrations below GCTLs for two consecutive monitoring events spaced approximately three years apart. These data indicate that contaminants are not migrating from the site at concentrations exceeding GCTLs.
3. Residual contamination of benzene near well S9MW-05 remains slightly above GCTLs, but has been declining in concentration since the enhanced biodegradation treatability study (EBTS) conducted in 2000.
4. Residual contamination of chlorinated VOCs including total 1,2-DCE and vinyl chloride near wells S9MW-14, -21, -22, and -24 remains above GCTLs. 1,2-DCE has been declining in concentration since the EBTS, however vinyl chloride has been inconsistently observed across these wells.
5. The occurrence of vinyl chloride suggests that biodegradation remains an active component of the natural attenuation processes at the site.
6. The contamination at SWMU 9 is confined to an area less than one-quarter acre immediately surrounding the inferred former source areas, and no contaminant migration is anticipated.
7. NFA under RMO II is appropriate for the site as outlined in Chapter 62-780.680 (2)(c)4. FAC and detailed in the Final Technical Report: Development of CTLs for Chapter 62-777, FAC (University of Florida, 2005).

The Final Groundwater Monitoring Report also presented the following recommendations (Battelle, 2014):

> Considering the current conceptual site model and the monitoring results from December 2013, it has been demonstrated that contamination at SWMU 9 meets the requirements established in Chapter 62-780.680 (2)(c)4 FAC.

Based on review and evaluation of these data, conclusions, and recommendations, it appears that NFA with controls (i.e., LUCs) is appropriate for SWMU 9. In the December 2013 event only vinyl chloride in one well, S9MW22, at a concentration of 73 µg/L, exceeded the GCTL of 1 µg/L. This value is anomalous in that vinyl chloride has appeared sporadically in site wells and at concentrations much lower than this value. The detection of vinyl chloride is evidence that biological degradation of chlorinated ethenes is occurring and that the remedy is functioning as intended.

It is evident from the historical trends in Figure 3-17 that the benzene concentration in S9MW05 is declining, and the 1,2-DCE concentrations in other key site wells are declining. Vinyl chloride shows an apparent increase in S9MW22 as discussed above, but this may be a temporary effect of biodegradation and the pattern of vinyl chloride concentrations may simply be lagging the increase, peak, and subsequent decline of 1,2-DCE concentrations in the same well (Figure 3-18).

It should also be noted that the GCTLs currently in use are based on the primary drinking water standards for the COCs. As is the case with other groundwater sites at NAS Key West, the groundwater may qualify as GIII nonpotable groundwater under FAC Chapter 62-520, and as such, may qualify as "poor quality" under FAC 62-777. As noted in the SOB (TtNUS, 2000f), groundwater was not considered a pathway of concern since the groundwater at SWMU 9 is not utilized for any purpose. This would have the effect of raising the GCTLs to 10 times the primary drinking water standards.

3.6.4.3 Site Inspection and Interviews

A site inspection, including interviews, was conducted for the five-year review. Information was recorded on site inspection/interview forms that are presented in Appendix C. No significant issues have been identified. Since access to the site is restricted, trespassing is minimal. In addition, warning signs are in place around the site perimeter, notifying base personnel that access to SWMU 9 is restricted.

3.6.5 Technical Assessment

The technical assessment is focused on three primary questions, each of which is presented below.

3.6.5.1 Question A

Is the remedy functioning as intended by the decision documents?

The remedy is functioning as intended, protecting aquatic ecological receptors in the adjacent lagoon. The remedy, enhanced biodegradation with long-term monitoring, has reduced the concentrations of chlorinated solvents and petroleum-related contaminants in groundwater at SWMU 9. Evaluation of groundwater COC data gathered since the previous five-year review Report (TtNUS, 2010a) demonstrates that the remedy is functioning as intended.

3.6.5.2 Question B

Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy still valid?

There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. There have been no significant changes to the standardized risk assessment methodology that could affect the protectiveness of the remedy. Toxicity criteria for TCE were updated in the EPA's Integrated Risk Information System on September 28, 2011, since the previous five-year review. TCE is not a risk driver in SWMU 9 groundwater; therefore the change to the TCE toxicity criteria has no practical impact. No other changes to toxicity criteria affect site COCs. Evaluation of groundwater monitoring data since the previous five-year review indicates that NFA under RMO II is appropriate and consistent with FDEP guidelines.

3.6.5.3 Question C

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

No other information has come to light that could call into question the protectiveness of the remedy.

3.6.5.4 Technical Assessment Summary

Based on evaluation of the most current data collected in December 2013, together with previous data, the remedy is protective of human health and the environment.

3.6.6 Issues

Based on recent monitoring results, site conditions indicate that NFA under RMO II [Chapter 62-780.680 (2)(c)4 FAC] is appropriate for the site. To obtain NFA, a Site Rehabilitation Completion Report should be developed, which demonstrates that all exposure pathways for all impacted site media meet FDEP requirements. Additional minor issues at SWMU 9 are the presence of the endangered Lower Keys marsh rabbit, and the presence of jurisdictional wetlands. There are no complete pathways for site COCs to impact the marsh rabbit, but any site restoration work involving heavy equipment or vehicle use within SWMU 9 would require consultations and/or permits from the U.S. Fish and Wildlife Service (FWS), FDEP, and the U.S. Army Corps of Engineers (USACE). For this reason, all work at SWMU 9 must be performed manually to avoid impacts to marsh rabbit habitat. No equipment, including vehicles or drill rigs, can be used off-pavement at SWMU 9.

3.6.7 Recommendations and Follow-up Actions

This corrective action effectiveness evaluation supports the following recommendations:

- Pursue a NFA determination for SWMU 9 under Chapter 62-780.680 (2)(c)4 FAC.
- The NAS Key West Partnering Team should develop a timeline for implementing the above recommendation.

3.6.8 Protectiveness Statement

The remedy at SWMU 9 is protective of human health and the environment.

3.6.9 Next Review

The next corrective action effectiveness evaluation for SWMU 9 is due to be completed five years following the signature date of this report. If the recommendations are adopted, the next corrective action effectiveness evaluation would be the final one for the site.

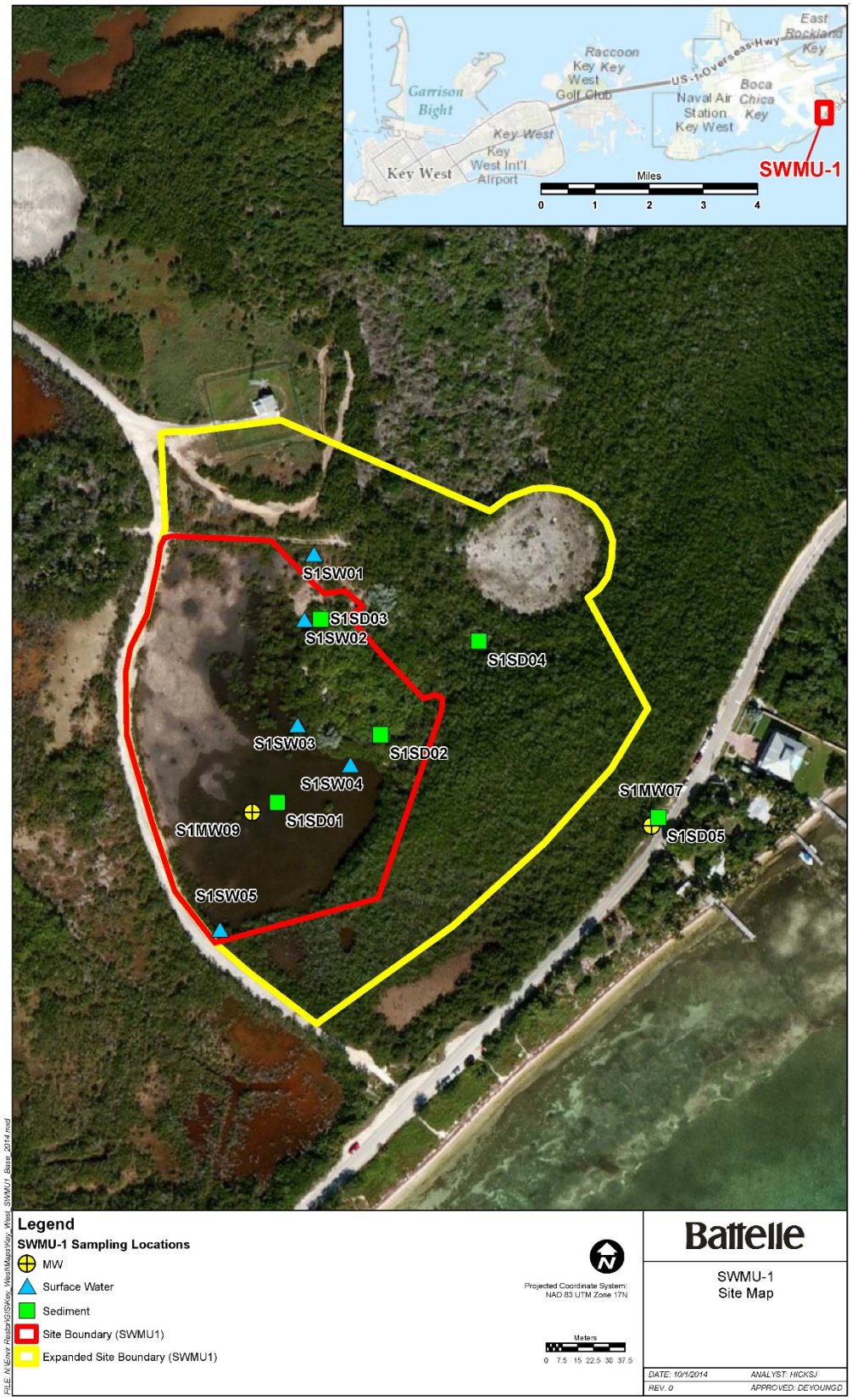
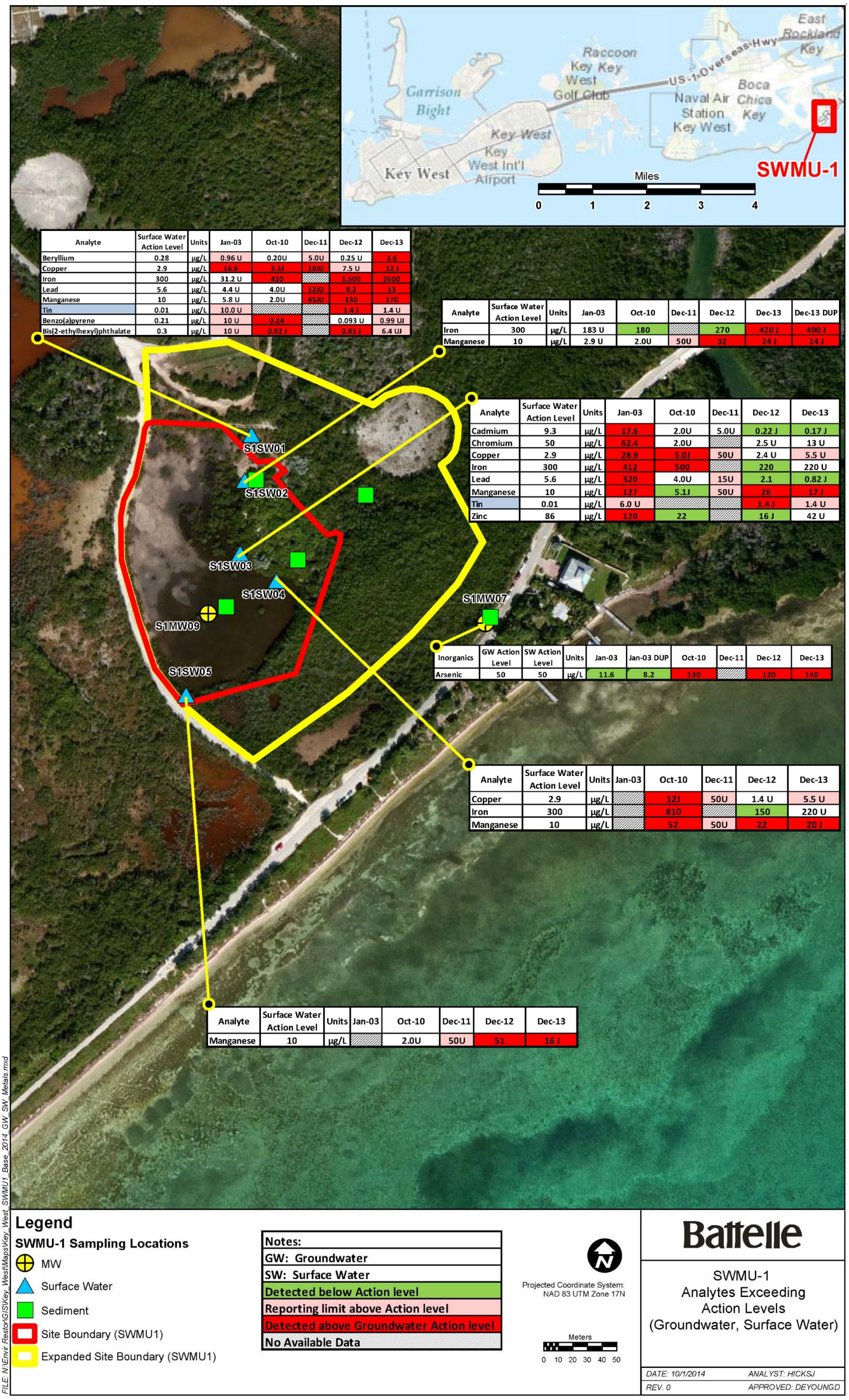


Figure 3-1. SWMU 1 Site Map



Analyte	Surface Water Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
Beryllium	0.28	µg/L	0.96 U	0.20U	5.0U	0.25 U	1.6
Copper	2.9	µg/L	16.6	3.3J	18JD	7.5 U	12 J
Iron	300	µg/L	31.2 U	420		1,500	2600
Lead	5.6	µg/L	4.4 U	4.0U	12JD	8.2	13
Manganese	10	µg/L	5.8 U	2.0U	45JD	130	170
Tin	0.01	µg/L	10.0 U			1.4 J	1.4 U
Benzo(a)pyrene	0.21	µg/L	10 U	0.24		0.093 U	0.99 UJ
Bis(2-ethylhexyl)phthalate	0.3	µg/L	10 U	0.92 J		0.85 J	6.4 UJ

Analyte	Surface Water Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Dec-13 DUP
Iron	300	µg/L	183 U	180		270	420 J	400 J
Manganese	10	µg/L	2.9 U	2.0U	50U	32	24 J	24 J

Analyte	Surface Water Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
Cadmium	9.3	µg/L	17.6	2.0U	5.0U	0.22 J	0.17 J
Chromium	50	µg/L	62.4	2.0U		2.5 U	13 U
Copper	2.9	µg/L	28.9	5.0J	50U	2.4 U	5.5 U
Iron	300	µg/L	412	500		220	220 U
Lead	5.6	µg/L	320	4.0U	15U	2.1	0.82 J
Manganese	10	µg/L	127	5.1J	50U	26	17 J
Tin	0.01	µg/L	6.0 U			1.4 J	1.4 U
Zinc	86	µg/L	120	22		16 J	42 U

Inorganics	GW Action Level	SW Action Level	Units	Jan-03	Jan-03 DUP	Oct-10	Dec-11	Dec-12	Dec-13
Arsenic	50	50	µg/L	11.6	8.2	130		120	140

Analyte	Surface Water Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
Copper	2.9	µg/L		12J	50U	1.4 U	5.5 U
Iron	300	µg/L		810		150	220 U
Manganese	10	µg/L		52	50U	22	20 J

Analyte	Surface Water Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
Manganese	10	µg/L		2.0U	50U	51	16 J

Legend

SWMU-1 Sampling Locations

- MW
- Surface Water
- Sediment
- Site Boundary (SWMU1)
- Expanded Site Boundary (SWMU1)

Notes:
GW: Groundwater
SW: Surface Water
Detected below Action level
Reporting limit above Action level
Detected above Groundwater Action level
No Available Data

Projected Coordinate System: NAD 83 UTM Zone 17N

Meters
0 10 20 30 40 50

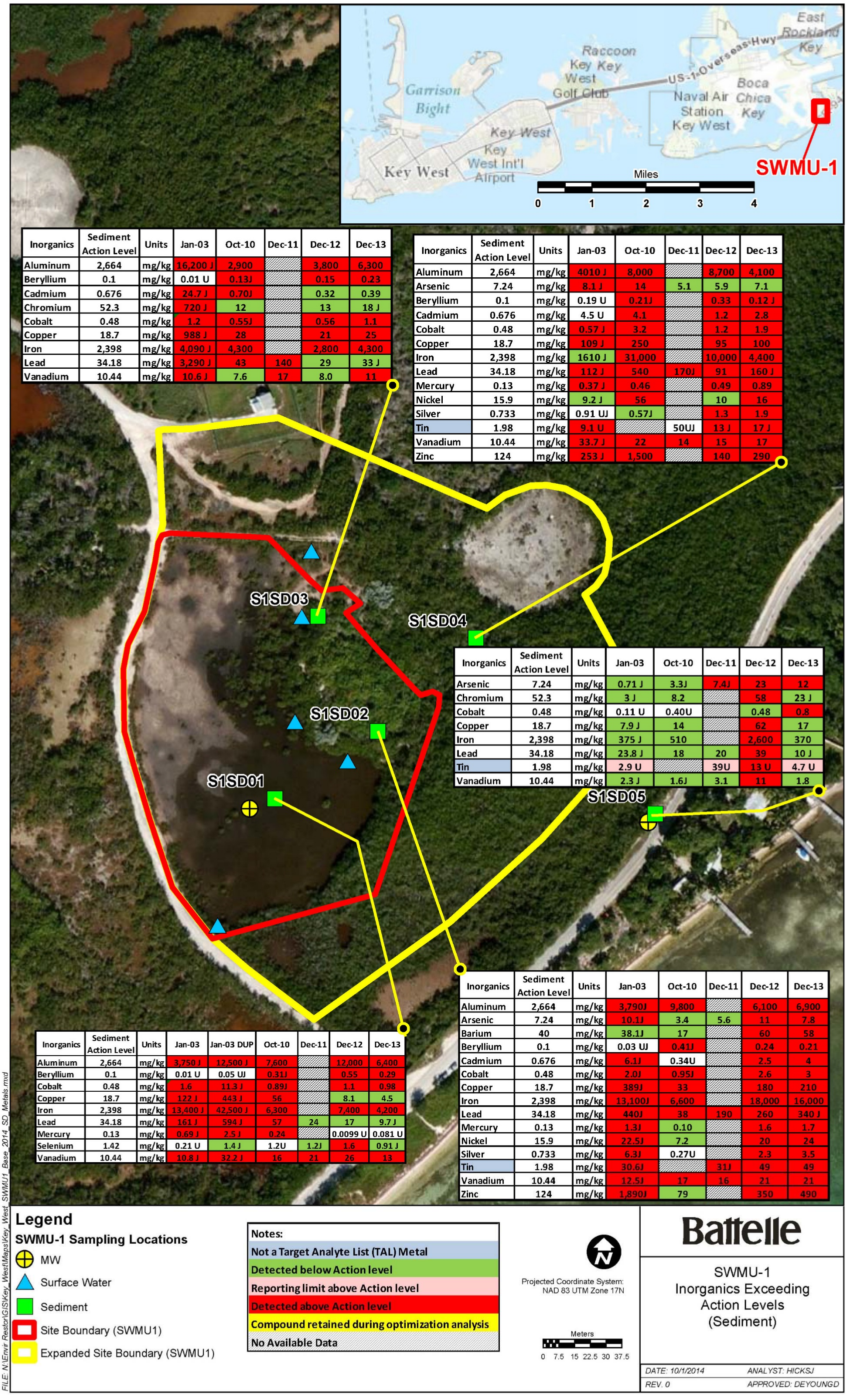
Battelle

SWMU-1
Analytes Exceeding
Action Levels
(Groundwater, Surface Water)

DATE: 10/1/2014 ANALYST: HICKSJ
REV. 0 APPROVED: DEYOUNGD

FILE: N:\Envir Restor\GIS\Key_West\Maps\Key_West_SWMU1_Base_2014_GW_SW_Metals.mxd

Figure 3-2. SWMU 1 2012 Groundwater and Surface Water Analyte Concentrations Exceeding Action Levels



Inorganics	Sediment Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
Aluminum	2,664	mg/kg	16,200 J	2,900		3,800	6,300
Beryllium	0.1	mg/kg	0.01 U	0.13J		0.15	0.23
Cadmium	0.676	mg/kg	24.7 J	0.70J		0.32	0.39
Chromium	52.3	mg/kg	720 J	12		13	18 J
Cobalt	0.48	mg/kg	1.2	0.55J		0.56	1.1
Copper	18.7	mg/kg	988 J	28		21	25
Iron	2,398	mg/kg	4,090 J	4,300		2,800	4,300
Lead	34.18	mg/kg	3,290 J	43	140	29	33 J
Vanadium	10.44	mg/kg	10.6 J	7.6	17	8.0	11

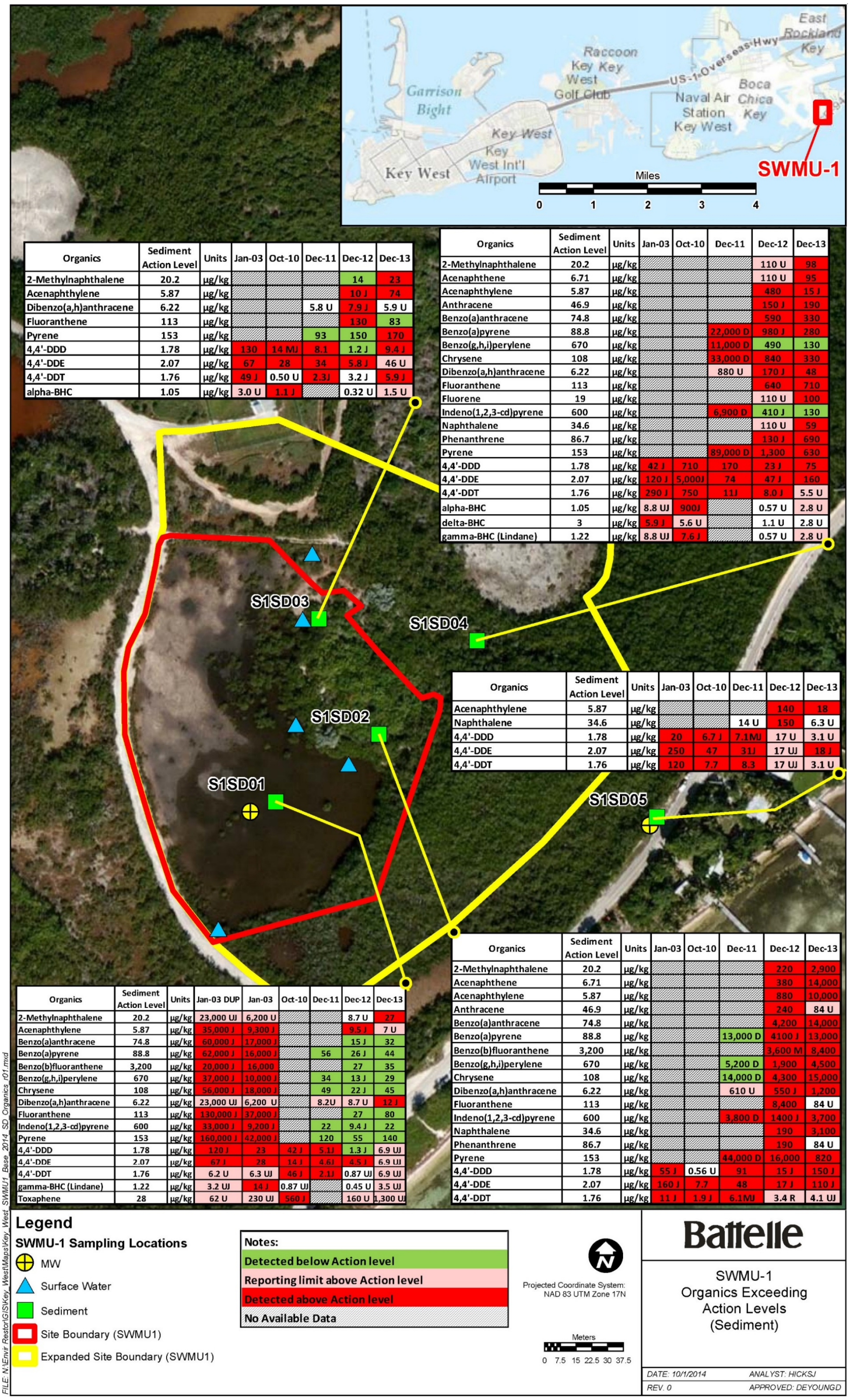
Inorganics	Sediment Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
Aluminum	2,664	mg/kg	4010 J	8,000		8,700	4,100
Arsenic	7.24	mg/kg	8.1 J	14	5.1	5.9	7.1
Beryllium	0.1	mg/kg	0.19 U	0.21J		0.33	0.12 J
Cadmium	0.676	mg/kg	4.5 U	4.1		1.2	2.8
Cobalt	0.48	mg/kg	0.57 J	3.2		1.2	1.9
Copper	18.7	mg/kg	109 J	250		95	100
Iron	2,398	mg/kg	1610 J	31,000		10,000	4,400
Lead	34.18	mg/kg	112 J	540	170J	91	160 J
Mercury	0.13	mg/kg	0.37 J	0.46		0.49	0.89
Nickel	15.9	mg/kg	9.2 J	56		10	16
Silver	0.733	mg/kg	0.91 UJ	0.57J		1.3	1.9
Tin	1.98	mg/kg	9.1 U		50UJ	13 J	17 J
Vanadium	10.44	mg/kg	33.7 J	22	14	15	17
Zinc	124	mg/kg	253 J	1,500		140	290

Inorganics	Sediment Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
Arsenic	7.24	mg/kg	0.71 J	3.3J	7.4J	23	12
Chromium	52.3	mg/kg	3 J	8.2		58	23 J
Cobalt	0.48	mg/kg	0.11 U	0.40U		0.48	0.8
Copper	18.7	mg/kg	7.9 J	14		62	17
Iron	2,398	mg/kg	375 J	510		2,600	370
Lead	34.18	mg/kg	23.8 J	18	20	39	10 J
Tin	1.98	mg/kg	2.9 U		39U	13 U	4.7 U
Vanadium	10.44	mg/kg	2.3 J	1.6J	3.1	11	1.8

Inorganics	Sediment Action Level	Units	Jan-03	Jan-03 DUP	Oct-10	Dec-11	Dec-12	Dec-13
Aluminum	2,664	mg/kg	3,750 J	12,500 J	7,600		12,000	6,400
Beryllium	0.1	mg/kg	0.01 U	0.05 UJ	0.31J		0.55	0.29
Cobalt	0.48	mg/kg	1.6	11.3 J	0.89J		1.1	0.98
Copper	18.7	mg/kg	122 J	443 J	56		8.1	4.5
Iron	2,398	mg/kg	13,400 J	42,500 J	6,300		7,400	4,200
Lead	34.18	mg/kg	161 J	594 J	57	24	17	9.7 J
Mercury	0.13	mg/kg	0.69 J	2.5 J	0.24		0.0099 U	0.081 U
Selenium	1.42	mg/kg	0.21 U	1.4 J	1.2U	1.2J	1.6	0.91 J
Vanadium	10.44	mg/kg	10.8 J	32.2 J	16	21	26	13

Inorganics	Sediment Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
Aluminum	2,664	mg/kg	3,790J	9,800		6,100	6,900
Arsenic	7.24	mg/kg	10.1J	3.4	5.6	11	7.8
Barium	40	mg/kg	38.1J	17		60	58
Beryllium	0.1	mg/kg	0.03 UJ	0.41J		0.24	0.21
Cadmium	0.676	mg/kg	6.1J	0.34U		2.5	4
Cobalt	0.48	mg/kg	2.0J	0.95J		2.6	3
Copper	18.7	mg/kg	389J	33		180	210
Iron	2,398	mg/kg	13,100J	6,600		18,000	16,000
Lead	34.18	mg/kg	440J	38	190	260	340 J
Mercury	0.13	mg/kg	1.3J	0.10		1.6	1.7
Nickel	15.9	mg/kg	22.5J	7.2		20	24
Silver	0.733	mg/kg	6.3J	0.27U		2.3	3.5
Tin	1.98	mg/kg	30.6J		31J	49	49
Vanadium	10.44	mg/kg	12.5J	17	16	21	21
Zinc	124	mg/kg	1,890J	79		350	490

Figure 3-3. SWMU 1 2012 Sediment Metal Analyte Concentrations Exceeding Action Levels



Organics	Sediment Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
2-Methylnaphthalene	20.2	µg/kg				14	23
Acenaphthylene	5.87	µg/kg				10 J	74
Dibenzo(a,h)anthracene	6.22	µg/kg			5.8 U	7.9 J	5.9 U
Fluoranthene	113	µg/kg				130	83
Pyrene	153	µg/kg			93	150	170
4,4'-DDD	1.78	µg/kg	130	14 MJ	8.1	1.2 J	9.4 J
4,4'-DDE	2.07	µg/kg	67	28	34	5.8 J	46 U
4,4'-DDT	1.76	µg/kg	49 J	0.50 U	2.3J	3.2 J	5.9 J
alpha-BHC	1.05	µg/kg	3.0 U	1.1 J		0.32 U	1.5 U

Organics	Sediment Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
2-Methylnaphthalene	20.2	µg/kg				110 U	98
Acenaphthene	6.71	µg/kg				110 U	95
Acenaphthylene	5.87	µg/kg				480	15 J
Anthracene	46.9	µg/kg				150 J	190
Benzo(a)anthracene	74.8	µg/kg				590	330
Benzo(a)pyrene	88.8	µg/kg			22,000 D	980 J	280
Benzo(g,h,i)perylene	670	µg/kg			11,000 D	490	130
Chrysene	108	µg/kg			33,000 D	840	330
Dibenzo(a,h)anthracene	6.22	µg/kg			880 U	170 J	48
Fluoranthene	113	µg/kg				640	710
Fluorene	19	µg/kg				110 U	100
Indeno(1,2,3-cd)pyrene	600	µg/kg			6,900 D	410 J	130
Naphthalene	34.6	µg/kg				110 U	59
Phenanthrene	86.7	µg/kg				130 J	690
Pyrene	153	µg/kg			89,000 D	1,300	630
4,4'-DDD	1.78	µg/kg	42 J	710	170	23 J	75
4,4'-DDE	2.07	µg/kg	120 J	5,000J	74	47 J	160
4,4'-DDT	1.76	µg/kg	290 J	750	11J	8.0 J	5.5 U
alpha-BHC	1.05	µg/kg	8.8 UJ	900J		0.57 U	2.8 U
delta-BHC	3	µg/kg	5.9 J	5.6 U		1.1 U	2.8 U
gamma-BHC (Lindane)	1.22	µg/kg	8.8 UJ	7.6 J		0.57 U	2.8 U

Organics	Sediment Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
Acenaphthylene	5.87	µg/kg				140	18
Naphthalene	34.6	µg/kg			14 U	150	6.3 U
4,4'-DDD	1.78	µg/kg	20	6.7 J	7.1MJ	17 U	3.1 U
4,4'-DDE	2.07	µg/kg	250	47	31J	17 UJ	18 J
4,4'-DDT	1.76	µg/kg	120	7.7	8.3	17 UJ	3.1 U

Organics	Sediment Action Level	Units	Jan-03 DUP	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
2-Methylnaphthalene	20.2	µg/kg	23,000 UJ	6,200 U			8.7 U	27
Acenaphthylene	5.87	µg/kg	35,000 J	9,300 J			9.5 J	7 U
Benzo(a)anthracene	74.8	µg/kg	60,000 J	17,000 J			15 J	32
Benzo(a)pyrene	88.8	µg/kg	62,000 J	16,000 J		56	26 J	44
Benzo(b)fluoranthene	3,200	µg/kg	20,000 J	16,000			27	35
Benzo(g,h,i)perylene	670	µg/kg	37,000 J	10,000 J		34	13 J	29
Chrysene	108	µg/kg	56,000 J	18,000 J		49	22 J	45
Dibenzo(a,h)anthracene	6.22	µg/kg	23,000 UJ	6,200 U		8.2U	8.7 U	12 J
Fluoranthene	113	µg/kg	130,000 J	37,000 J			27	80
Indeno(1,2,3-cd)pyrene	600	µg/kg	33,000 J	9,200 J		22	9.4 J	22
Pyrene	153	µg/kg	160,000 J	42,000 J		120	55	140
4,4'-DDD	1.78	µg/kg	120 J	23	42 J	5.1J	1.3 J	6.9 UJ
4,4'-DDE	2.07	µg/kg	67 J	28	14 J	4.6J	4.5 J	6.9 UJ
4,4'-DDT	1.76	µg/kg	6.2 U	6.3 UJ	46 J	2.1J	0.87 UJ	6.9 UJ
gamma-BHC (Lindane)	1.22	µg/kg	3.2 UJ	14 J	0.87 UJ		0.45 U	3.5 UJ
Toxaphene	28	µg/kg	62 U	230 UJ	560 J		160 U	1,300 UJ

Organics	Sediment Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
2-Methylnaphthalene	20.2	µg/kg				220	2,900
Acenaphthene	6.71	µg/kg				380	14,000
Acenaphthylene	5.87	µg/kg				880	10,000
Anthracene	46.9	µg/kg				240	84 U
Benzo(a)anthracene	74.8	µg/kg				4,200	14,000
Benzo(a)pyrene	88.8	µg/kg			13,000 D	4100 J	13,000
Benzo(b)fluoranthene	3,200	µg/kg				3,600 M	8,400
Benzo(g,h,i)perylene	670	µg/kg			5,200 D	1,900	4,500
Chrysene	108	µg/kg			14,000 D	4,300	15,000
Dibenzo(a,h)anthracene	6.22	µg/kg			610 U	550 J	1,200
Fluoranthene	113	µg/kg				8,400	84 U
Indeno(1,2,3-cd)pyrene	600	µg/kg			3,800 D	1400 J	3,700
Naphthalene	34.6	µg/kg				190	3,100
Phenanthrene	86.7	µg/kg				190	84 U
Pyrene	153	µg/kg			44,000 D	16,000	820
4,4'-DDD	1.78	µg/kg	55 J	0.56 U	91	15 J	150 J
4,4'-DDE	2.07	µg/kg	160 J	7.7	48	17 J	110 J
4,4'-DDT	1.76	µg/kg	11 J	1.9 J	6.1MJ	3.4 R	4.1 UJ

Figure 3-4. SWMU 1 2012 Sediment Organic Analyte Concentrations Exceeding Action Levels

Figure 3-5. SWMU 2 Site Map

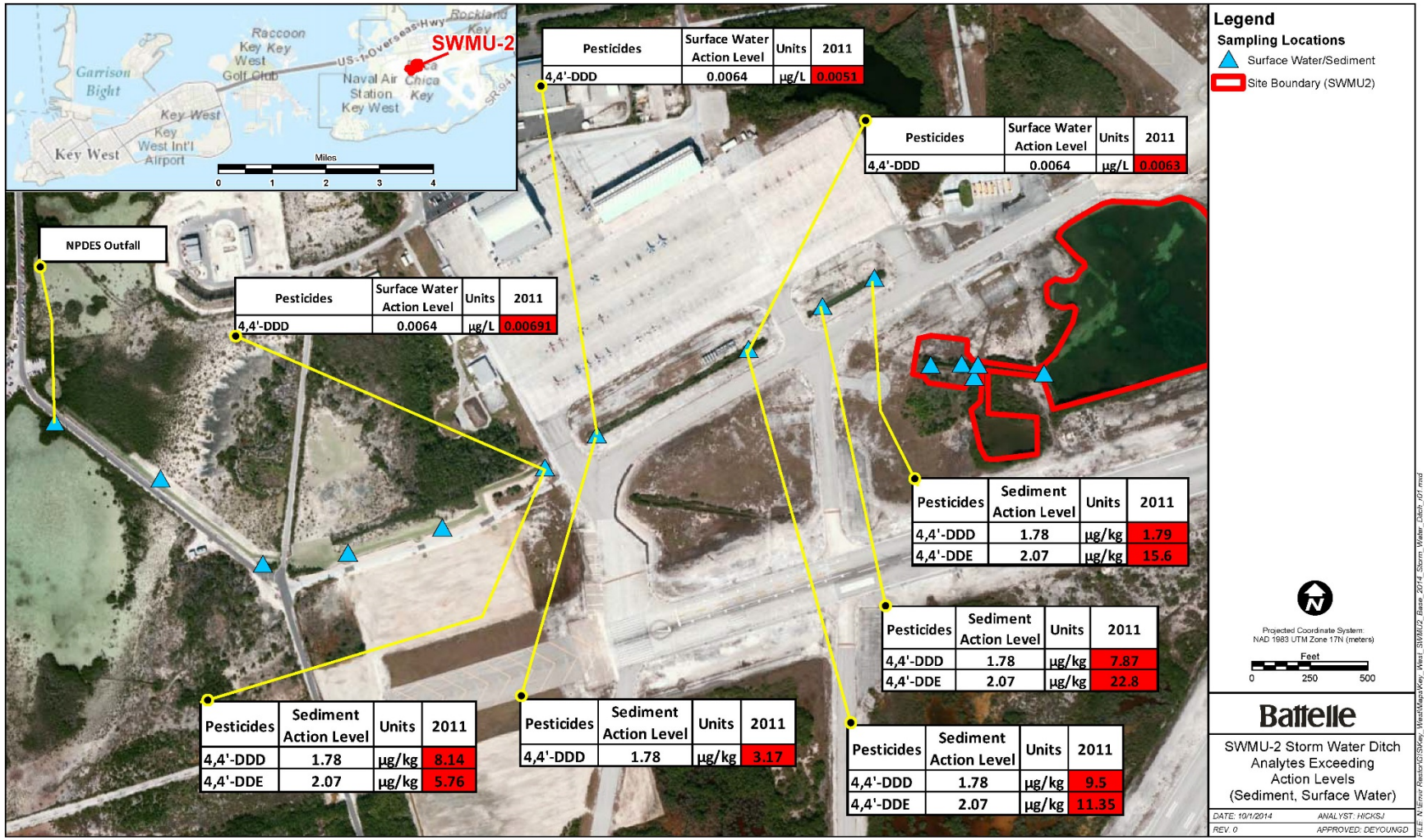
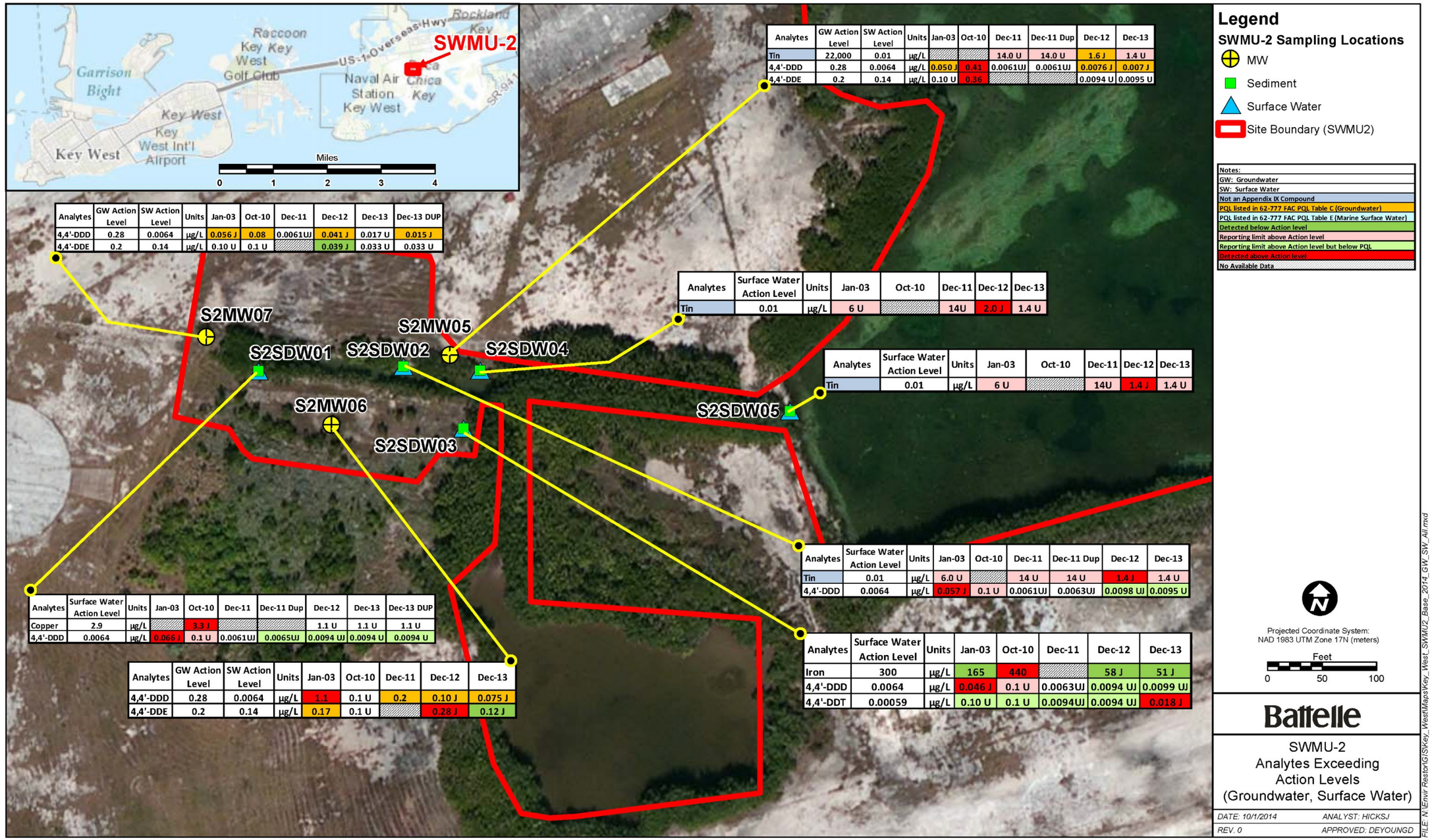


Figure 3-6. SWMU 2 2011 Storm Water Ditch Pesticide Analyte Concentrations Exceeding Action Levels



Analytes	GW Action Level	SW Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Dec-13 DUP
4,4'-DDD	0.28	0.0064	µg/L	0.056 J	0.08	0.0061UJ	0.041 J	0.017 U	0.015 J
4,4'-DDE	0.2	0.14	µg/L	0.10 U	0.1 U		0.039 J	0.033 U	0.033 U

Analytes	GW Action Level	SW Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-11 Dup	Dec-12	Dec-13
Tin	22,000	0.01	µg/L			14.0 U	14.0 U	1.6 J	1.4 U
4,4'-DDD	0.28	0.0064	µg/L	0.050 J	0.41	0.0061UJ	0.0061UJ	0.0076 J	0.007 J
4,4'-DDE	0.2	0.14	µg/L	0.10 U	0.36			0.0094 U	0.0095 U

Analytes	Surface Water Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
Tin	0.01	µg/L	6 U		14U	2.0 J	1.4 U

Analytes	Surface Water Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
Tin	0.01	µg/L	6 U		14U	1.4 J	1.4 U

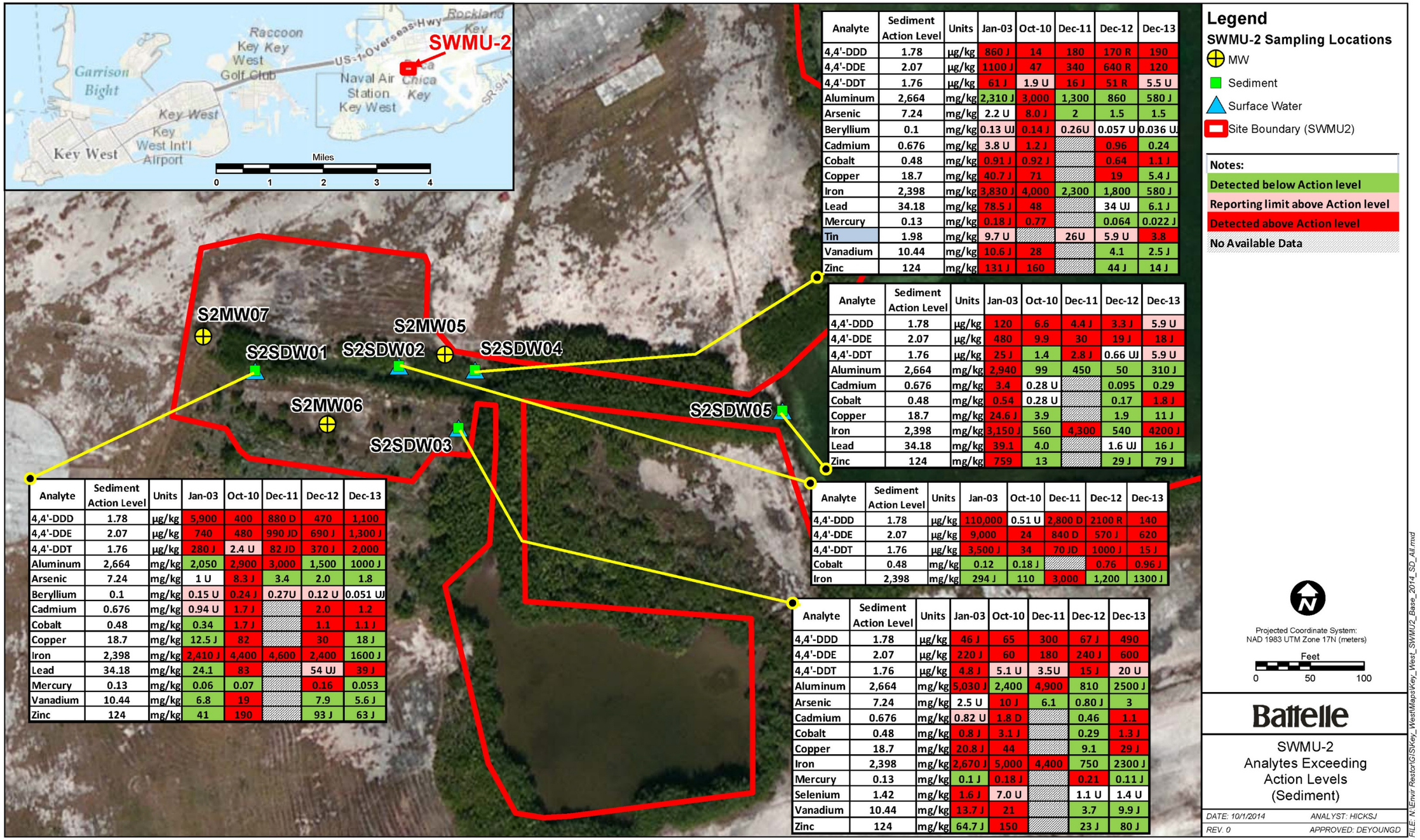
Analytes	Surface Water Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-11 Dup	Dec-12	Dec-13
Tin	0.01	µg/L	6.0 U		14 U	14 U	1.4 J	1.4 U
4,4'-DDD	0.0064	µg/L	0.057 J	0.1 U	0.0061UJ	0.0063UJ	0.0098 UJ	0.0095 U

Analytes	Surface Water Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-11 Dup	Dec-12	Dec-13	Dec-13 DUP
Copper	2.9	µg/L		3.3 J			1.1 U	1.1 U	1.1 U
4,4'-DDD	0.0064	µg/L	0.066 J	0.1 U	0.0061UJ	0.0065UJ	0.0094 UJ	0.0094 U	0.0094 U

Analytes	Surface Water Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
Iron	300	µg/L	165	440		58 J	51 J
4,4'-DDD	0.0064	µg/L	0.046 J	0.1 U	0.0063UJ	0.0094 UJ	0.0099 UJ
4,4'-DDT	0.00059	µg/L	0.10 U	0.1 U	0.0094UJ	0.0094 UJ	0.018 J

Analytes	GW Action Level	SW Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
4,4'-DDD	0.28	0.0064	µg/L	1.1	0.1 U	0.2	0.10 J	0.075 J
4,4'-DDE	0.2	0.14	µg/L	0.17	0.1 U		0.28 J	0.12 J

Figure 3-7. SWMU 2 2012 Groundwater and Surface Water Analyte Concentrations Exceeding Action Levels



Analyte	Sediment Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
4,4'-DDD	1.78	µg/kg	860 J	14	180	170 R	190
4,4'-DDE	2.07	µg/kg	1100 J	47	340	640 R	120
4,4'-DDT	1.76	µg/kg	61 J	1.9 U	16 J	51 R	5.5 U
Aluminum	2,664	mg/kg	2,310 J	3,000	1,300	860	580 J
Arsenic	7.24	mg/kg	2.2 U	8.0 J	2	1.5	1.5
Beryllium	0.1	mg/kg	0.13 UJ	0.14 J	0.26U	0.057 U	0.036 UJ
Cadmium	0.676	mg/kg	3.8 U	1.2 J		0.96	0.24
Cobalt	0.48	mg/kg	0.91 J	0.92 J		0.64	1.1 J
Copper	18.7	mg/kg	40.7 J	71		19	5.4 J
Iron	2,398	mg/kg	3,830 J	4,000	2,300	1,800	580 J
Lead	34.18	mg/kg	78.5 J	48		34 UJ	6.1 J
Mercury	0.13	mg/kg	0.18 J	0.77		0.064	0.022 J
Tin	1.98	mg/kg	9.7 U		26U	5.9 U	3.8
Vanadium	10.44	mg/kg	10.6 J	28		4.1	2.5 J
Zinc	124	mg/kg	131 J	160		44 J	14 J

Analyte	Sediment Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
4,4'-DDD	1.78	µg/kg	120	6.6	4.4 J	3.3 J	5.9 U
4,4'-DDE	2.07	µg/kg	480	9.9	30	19 J	18 J
4,4'-DDT	1.76	µg/kg	25 J	1.4	2.8 J	0.66 UJ	5.9 U
Aluminum	2,664	mg/kg	2,940	99	450	50	310 J
Cadmium	0.676	mg/kg	3.4	0.28 U		0.095	0.29
Cobalt	0.48	mg/kg	0.54	0.28 U		0.17	1.8 J
Copper	18.7	mg/kg	24.6 J	3.9		1.9	11 J
Iron	2,398	mg/kg	3,150 J	560	4,300	540	4200 J
Lead	34.18	mg/kg	39.1	4.0		1.6 UJ	16 J
Zinc	124	mg/kg	759	13		29 J	79 J

Analyte	Sediment Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
4,4'-DDD	1.78	µg/kg	5,900	400	880 D	470	1,100
4,4'-DDE	2.07	µg/kg	740	480	990 JD	690 J	1,300 J
4,4'-DDT	1.76	µg/kg	280 J	2.4 U	82 JD	370 J	2,000
Aluminum	2,664	mg/kg	2,050	2,900	3,000	1,500	1000 J
Arsenic	7.24	mg/kg	1 U	8.3 J	3.4	2.0	1.8
Beryllium	0.1	mg/kg	0.15 U	0.24 J	0.27U	0.12 U	0.051 UJ
Cadmium	0.676	mg/kg	0.94 U	1.7 J		2.0	1.2
Cobalt	0.48	mg/kg	0.34	1.7 J		1.1	1.1 J
Copper	18.7	mg/kg	12.5 J	82		30	18 J
Iron	2,398	mg/kg	2,410 J	4,400	4,600	2,400	1600 J
Lead	34.18	mg/kg	24.1	83		54 UJ	39 J
Mercury	0.13	mg/kg	0.06	0.07		0.16	0.053
Vanadium	10.44	mg/kg	6.8	19		7.9	5.6 J
Zinc	124	mg/kg	41	190		93 J	63 J

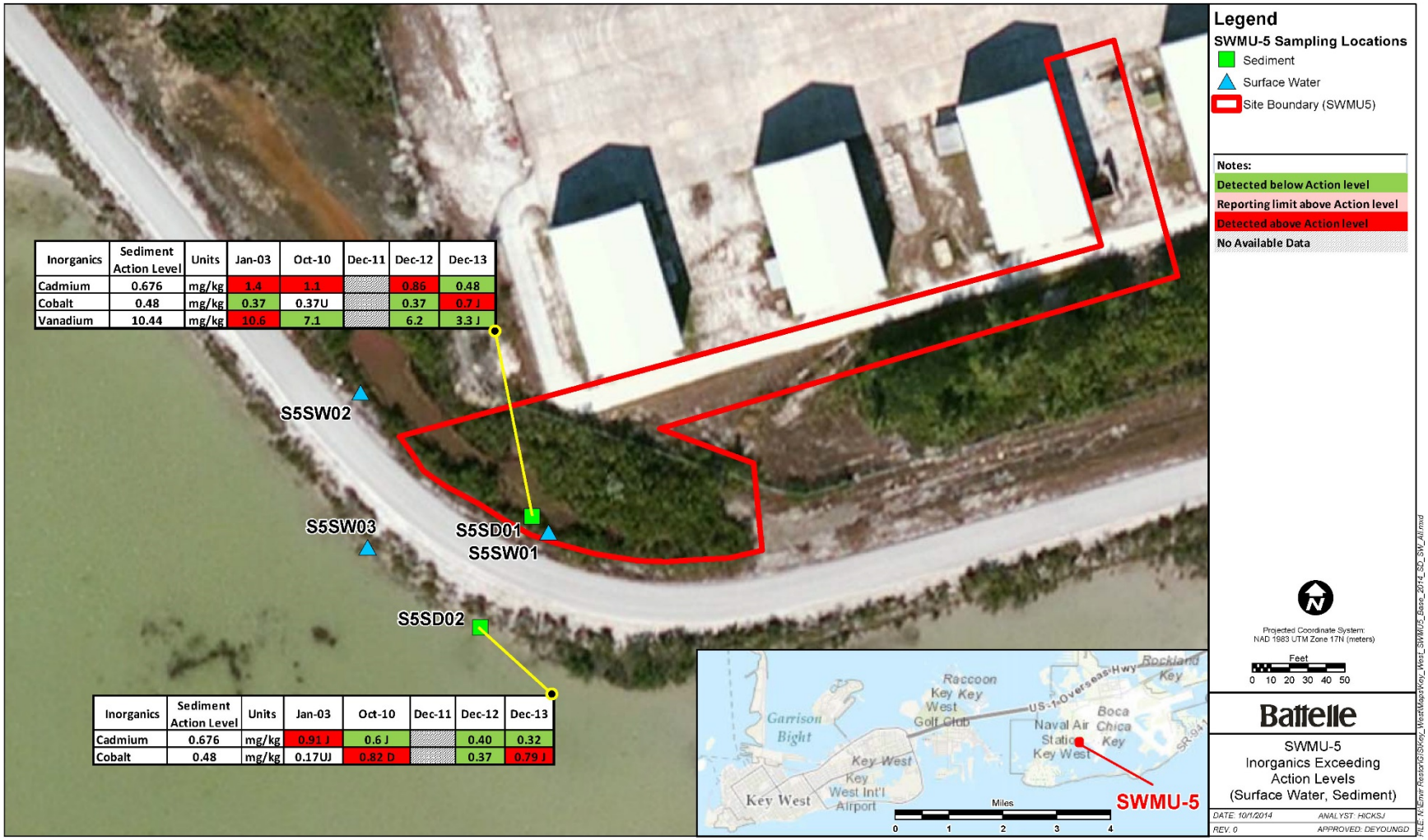
Analyte	Sediment Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
4,4'-DDD	1.78	µg/kg	110,000	0.51 U	2,800 D	2100 R	140
4,4'-DDE	2.07	µg/kg	9,000	24	840 D	570 J	620
4,4'-DDT	1.76	µg/kg	3,500 J	34	70 JD	1000 J	15 J
Cobalt	0.48	mg/kg	0.12	0.18 J		0.76	0.96 J
Iron	2,398	mg/kg	294 J	110	3,000	1,200	1300 J

Analyte	Sediment Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
4,4'-DDD	1.78	µg/kg	46 J	65	300	67 J	490
4,4'-DDE	2.07	µg/kg	220 J	60	180	240 J	600
4,4'-DDT	1.76	µg/kg	4.8 J	5.1 U	3.5U	15 J	20 U
Aluminum	2,664	mg/kg	5,030 J	2,400	4,900	810	2500 J
Arsenic	7.24	mg/kg	2.5 U	10 J	6.1	0.80 J	3
Cadmium	0.676	mg/kg	0.82 U	1.8 D		0.46	1.1
Cobalt	0.48	mg/kg	0.8 J	3.1 J		0.29	1.3 J
Copper	18.7	mg/kg	20.8 J	44		9.1	29 J
Iron	2,398	mg/kg	2,670 J	5,000	4,400	750	2300 J
Mercury	0.13	mg/kg	0.1 J	0.18 J		0.21	0.11 J
Selenium	1.42	mg/kg	1.6 J	7.0 U		1.1 U	1.4 U
Vanadium	10.44	mg/kg	13.7 J	21		3.7	9.9 J
Zinc	124	mg/kg	64.7 J	150		23 J	80 J

Figure 3-8. SWMU 2 2012 Sediment Analyte Concentrations Exceeding Action Levels

Figure 3-9. SWMU 3 Site Map

Figure 3-10. SWMU 5 Site Map



Inorganics	Sediment Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
Cadmium	0.676	mg/kg	1.4	1.1		0.86	0.48
Cobalt	0.48	mg/kg	0.37	0.37U		0.37	0.7 J
Vanadium	10.44	mg/kg	10.6	7.1		6.2	3.3 J

Inorganics	Sediment Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
Cadmium	0.676	mg/kg	0.91 J	0.6 J		0.40	0.32
Cobalt	0.48	mg/kg	0.17UJ	0.82 D		0.37	0.79 J

Figure 3-11. SWMU 5 2012 Surface Water and Sediment Metals Concentrations Exceeding Action Levels

Figure 3-12. SWMU 7 Site Map

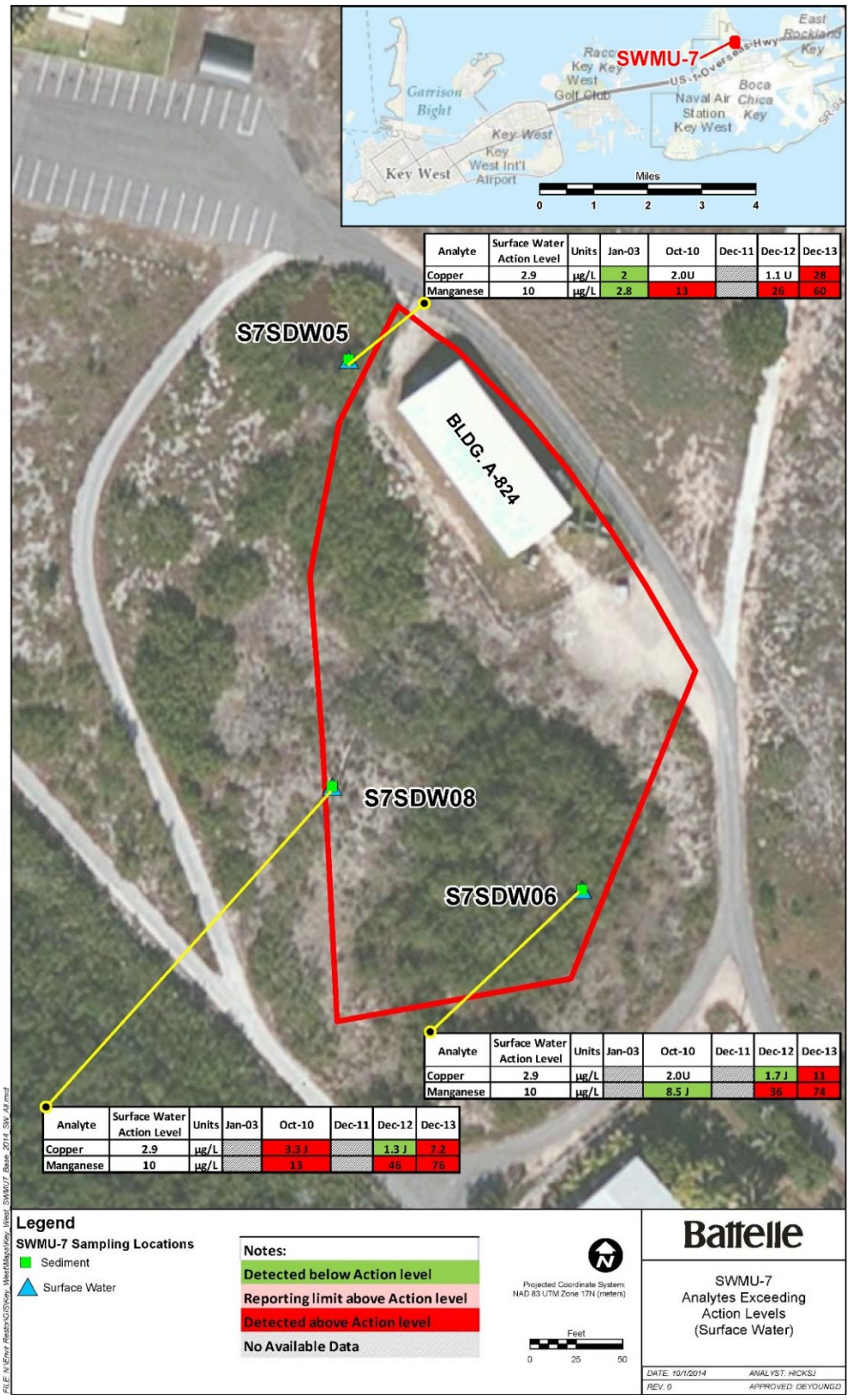
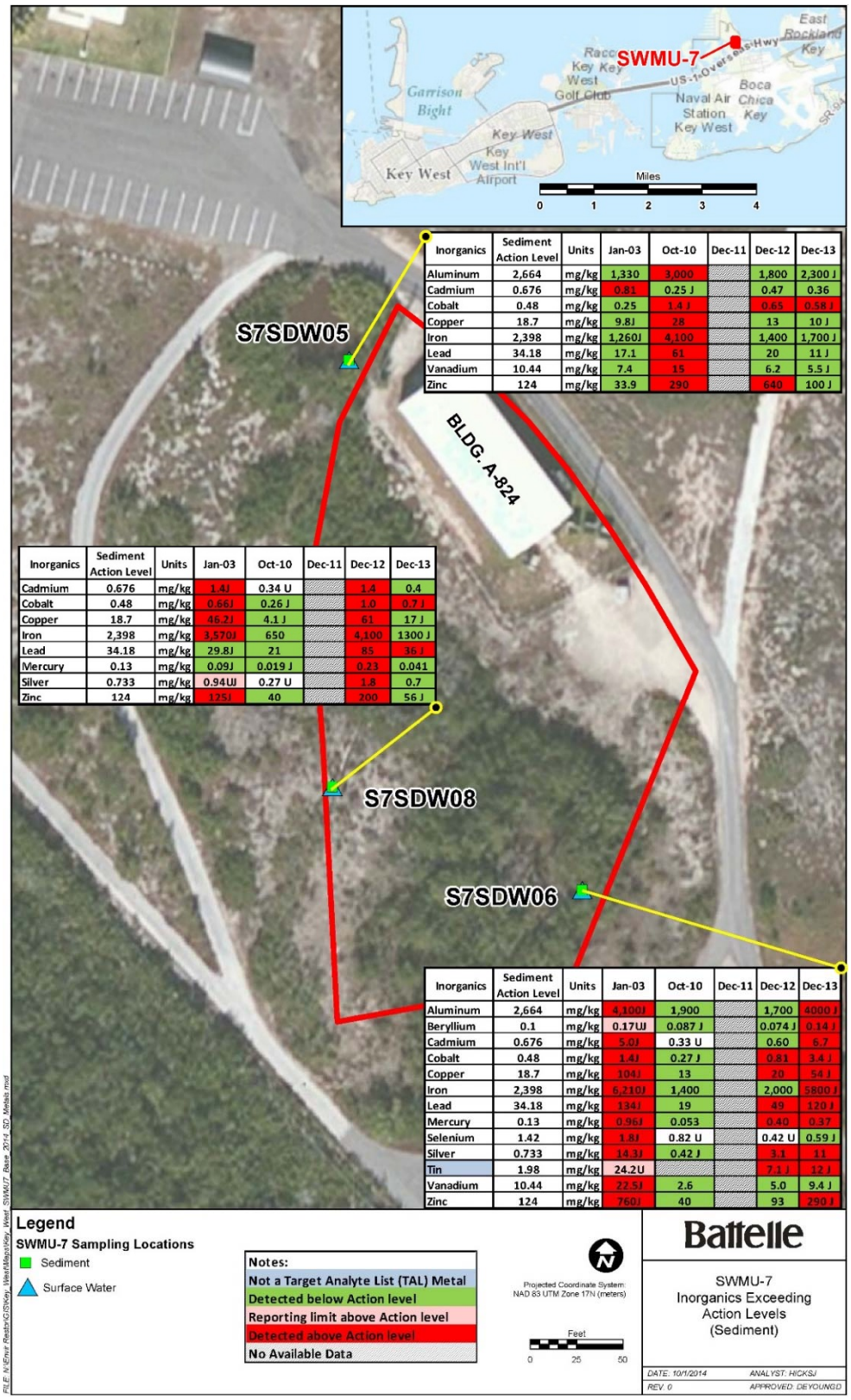


Figure 3-13. SWMU 7 2012 Surface Water Analyte Concentrations Exceeding Action Levels

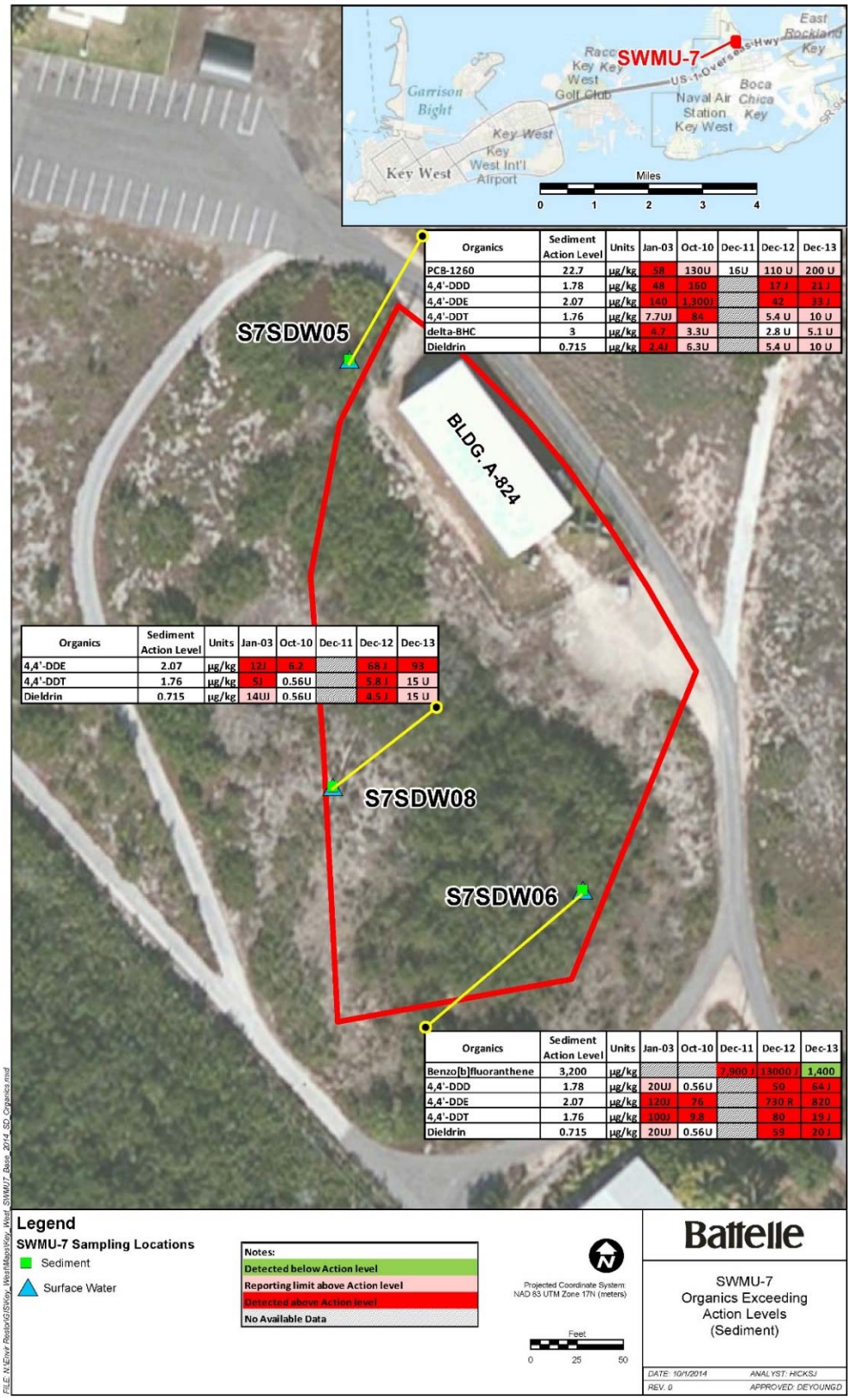


Inorganics	Sediment Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
Aluminum	2,664	mg/kg	1,330	3,000		1,800	2,300 J
Cadmium	0.676	mg/kg	0.81	0.25 J		0.47	0.36
Cobalt	0.48	mg/kg	0.25	1.4 J		0.65	0.58 J
Copper	18.7	mg/kg	9.8J	28		13	10 J
Iron	2,398	mg/kg	1,260J	4,100		1,400	1,700 J
Lead	34.18	mg/kg	17.1	61		20	11 J
Vanadium	10.44	mg/kg	7.4	15		6.2	5.5 J
Zinc	124	mg/kg	33.9	290		640	100 J

Inorganics	Sediment Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
Cadmium	0.676	mg/kg	1.4J	0.34 U		1.4	0.4
Cobalt	0.48	mg/kg	0.66J	0.26 J		1.0	0.7 J
Copper	18.7	mg/kg	46.2J	4.1 J		61	17 J
Iron	2,398	mg/kg	3,570J	650		4,100	1300 J
Lead	34.18	mg/kg	29.8J	21		85	36 J
Mercury	0.13	mg/kg	0.09J	0.019 J		0.23	0.041
Silver	0.733	mg/kg	0.94UJ	0.27 U		1.8	0.7
Zinc	124	mg/kg	125J	40		200	56 J

Inorganics	Sediment Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
Aluminum	2,664	mg/kg	4,100J	1,900		1,700	4000 J
Beryllium	0.1	mg/kg	0.17UJ	0.087 J		0.074 J	0.14 J
Cadmium	0.676	mg/kg	5.0J	0.33 U		0.60	6.7
Cobalt	0.48	mg/kg	1.4J	0.27 J		0.81	3.4 J
Copper	18.7	mg/kg	104J	13		20	54 J
Iron	2,398	mg/kg	6,210J	1,400		2,000	5800 J
Lead	34.18	mg/kg	134J	19		49	120 J
Mercury	0.13	mg/kg	0.96J	0.053		0.40	0.37
Selenium	1.42	mg/kg	1.8J	0.82 U		0.42 U	0.59 J
Silver	0.733	mg/kg	14.3J	0.42 J		3.1	11
Tin	1.98	mg/kg	24.2U			7.1 J	12 J
Vanadium	10.44	mg/kg	22.5J	2.6		5.0	9.4 J
Zinc	124	mg/kg	760J	40		93	290 J

Figure 3-14. SWMU 7 2012 Sediment Metals Concentrations Exceeding Action Levels



Organics	Sediment Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
PCB-1260	22.7	µg/kg	58	130U	16U	110 U	200 U
4,4'-DDD	1.78	µg/kg	48	160		17 J	21 J
4,4'-DDE	2.07	µg/kg	140	1,300J		42	33 J
4,4'-DDT	1.76	µg/kg	7.7UJ	84		5.4 U	10 U
delta-BHC	3	µg/kg	4.7	3.3U		2.8 U	5.1 U
Dieldrin	0.715	µg/kg	2.4J	6.3U		5.4 U	10 U

Organics	Sediment Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
4,4'-DDE	2.07	µg/kg	12J	6.2		68 J	93
4,4'-DDT	1.76	µg/kg	5J	0.56U		5.8 J	15 U
Dieldrin	0.715	µg/kg	14UJ	0.56U		4.5 J	15 U

Organics	Sediment Action Level	Units	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13
Benzo[b]fluoranthene	3,200	µg/kg			1,900 J	13000 J	1,400
4,4'-DDD	1.78	µg/kg	20UJ	0.56U		50	64 J
4,4'-DDE	2.07	µg/kg	120J	76		730 R	820
4,4'-DDT	1.76	µg/kg	100J	9.8		80	19 J
Dieldrin	0.715	µg/kg	20UJ	0.56U		59	20 J

Figure 3-15 SWMU 7 2012 Sediment Organic Analyte Concentrations Exceeding Action Levels

Figure 3-16. SWMU 9 Site Map

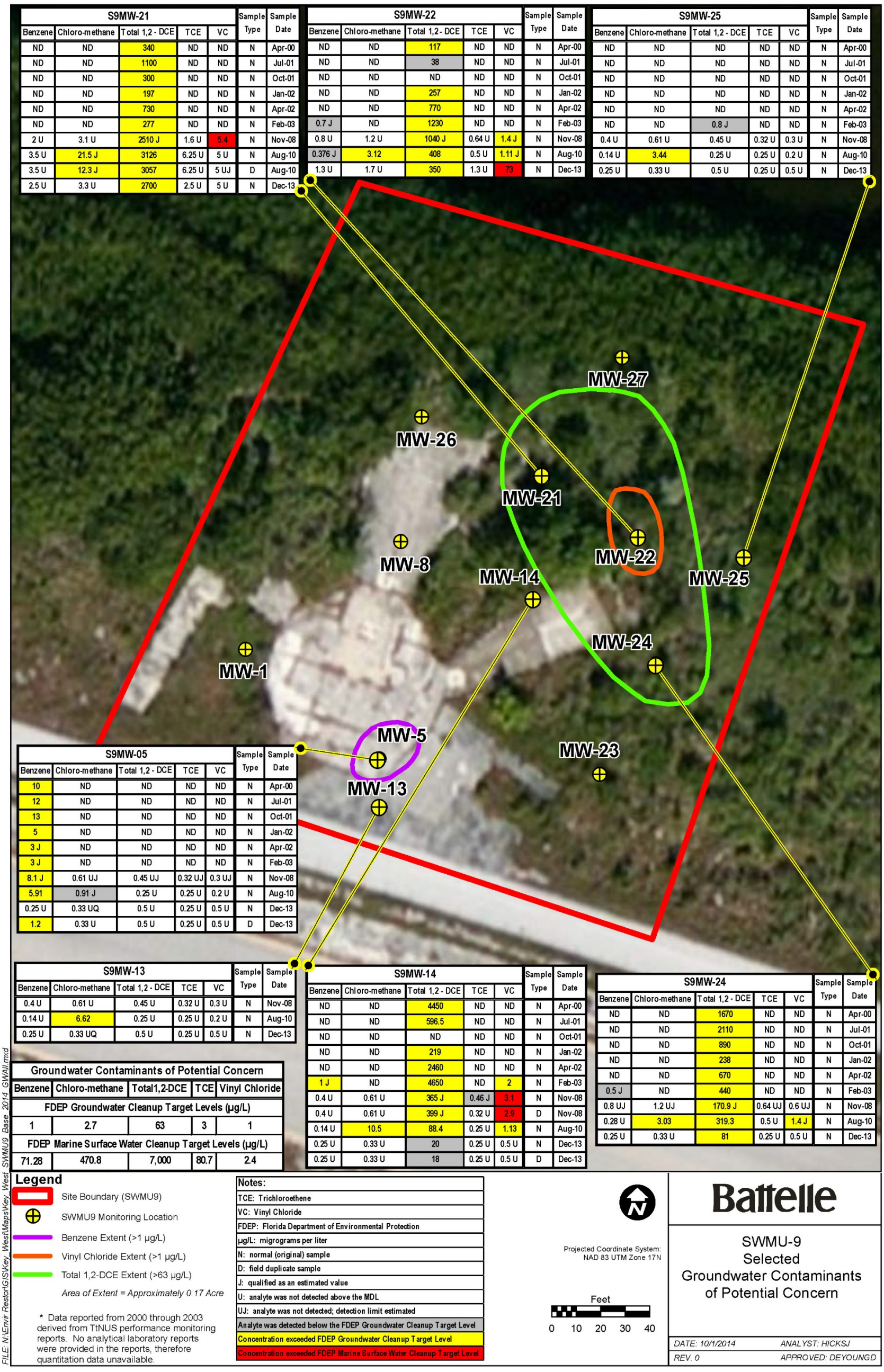


Figure 3-17. SWMU 9 Selected December 2013 Groundwater COC Concentrations

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APPENDIX A

RECENT AND HISTORICAL DATA

Table 1. Summary List of Corrective Actions at APM Sites

SWMU 1 - Boca Chica Open Disposal Area	
Investigation/Activity	**Date**
Site operations	1942 to mid-1960s
3 aboveground storage tanks (ASTs) removed (portion of one remained until 2002)	before 1985
IAS Report issued by Envirodyne Engineers, Inc.	May 1985
Verification Study Assessment issued by G&M	March 1987
VSI conducted by EPA as documented in the RFA Report	April 1988
Preliminary RI Report issued by IT	January 1991
RFI/RI Report issued by IT	June 1994
Delineation Sampling Report produced by Bechtel Environmental, Inc. (BEI)	November 1995
IRA excavation completed by BEI	April 1996
Supplemental RFI/RI Report for High-Priority Sites issued by B&RE	July 1997
CMS Report for SWMU 1 issued by B&RE	March 1998
Statement of Basis issued by TtNUS	July 1998
First year of Quarterly Performance Monitoring implemented by TtNUS	April 2000
Delineation sampling completed by CH2MHill Constructors, Inc. (CCI)	March 2001
APM conducted by TtNUS	January 2002
Excavation of petroleum contaminated soil completed by CCI	March 2003
APM conducted by TtNUS	January 2003
RCRA Corrective Action Management Plan (CAMP), Rev. 4 issued by TtNUS	July 2003
APM conducted by REA	January 2004
Five-Year Review conducted by TtNUS	December 2004
APM conducted by REA	February 2005
APM conducted by REA	February 2006
APM conducted by REA	January 2007
APM conducted by REA	January 2008
APM conducted by OHC	January 2009
APM conducted by OHC	April 2010
APM conducted by Enviro Compliance Solutions, Inc. (ECS)	December 2011
APM conducted by Enviro Compliance Solutions, Inc. (ECS)	December 2012
APM conducted by Battelle	December 2013
SWMU 2 - Boca Chica DDT Mixing Area	
Investigation/Activity	**Date**
Site operations	1940s - early 1970s
DDT Mixing Building 915 demolished	June 1905
AST removal, spillage occurred	unknown
IAS Report produced by Envirodyne Engineers, Inc.	May 1985
Verification Study Assessment issued by G&M	March 1987
VSI performed by the EPA as documented in the RFA Report	April 1988
Preliminary RI Report issued by IT	January 1991
RFI/RI Report issued by IT	June 1994
Delineation Sampling Report for IRA issued by BEI	November 1995
IRA excavation completed by BEI	April 1996
Supplemental RFI/RI Report for High-Priority Sites produced by B&RE	July 1997
CMS Report issued by TtNUS	March 1998
Statement of Basis issued by TtNUS	July 1998
First year of Quarterly Performance Monitoring implemented by TtNUS	April 2000
APM conducted by TtNUS	January 2002
APM conducted by TtNUS	January 2003
RCRA CAMP (Rev. 4) conducted by TtNUS	July 2003
APM conducted by REA	January 2004
Five-Year Review conducted by TtNUS	December 2004

Table 1. Summary List of Corrective Actions at APM Sites (Continued)

SWMU 2 - Boca Chica DDT Mixing Area (Continued)	
Investigation/Activity	**Date**
APM conducted by REA	February 2005
APM conducted by REA	February 2006
APM conducted by REA	January 2007
Post Storm Surge Evaluation conducted by TtNUS	December 2007
APM conducted by REA	January 2008
APM conducted by OHC	January 2009
Draft Uniform Federal Policy Sampling and Analysis Plan, SWMU 2	November 2009
APM conducted by OHC	April 2010
APM conducted by Enviro Compliance Solutions, Inc. (ECS)	December 2011
APM conducted by ECS	December 2012
APM conducted by Battelle	December 2013
SWMU 5 - Boca Chica AIMD Building A-990 Sand Blasting Area	
Investigation/Activity	**Date**
Sand Blasting Operations	1970-1995
RFI/RI Report issued by IT Corporation	June 1994
Supplemental RFI/RI Report for Eight Sites issued by B&RE	January 1998
CMS Report for SWMU 5 prepared by TtNUS	March 1999
Statement of Basis SWMU 5 issued by TtNUS	February 1999
First year of Quarterly Performance Monitoring implemented by TtNUS	April 2000
APM conducted by TtNUS	January 2002
APM conducted by TtNUS	January 2003
RCRA CAMP (Rev. 4) prepared by TtNUS	July 2003
APM conducted by REA	January 2004
Five-Year Review conducted by TtNUS	December 2004
APM conducted by REA	February 2005
APM conducted by REA	February 2006
APM conducted by REA	January 2007
Post Storm Surge Evaluation conducted by TtNUS	December 2007
APM conducted by REA	January 2008
APM conducted by OHC	January 2009
APM conducted by OHC	April 2010
APM conducted by Enviro Compliance Solutions, Inc. (ECS)	December 2011
APM conducted by ECS	December 2012
APM conducted by Battelle	December 2013
SWMU 7 - Boca Chica Temporary Hazardous Waste Storage Area	
Investigation/Activity	**Date**
VSI conducted by EPA as documented in the RFA Report	April 1988
Investigation and clean-up by Blasland, Bouck, and Lee, Inc. (BBL)	March 1991
RFI/RI Report issued by IT	June 1994
Delineation Sampling Report produced by BEI	November 1995
IRA excavation completed by BEI	October 1995
Supplemental RFI/RI Report for Eight Sites produced by B&RE	January 1998
CMS Report for SWMU 7 issued by TtNUS	March 1999
Statement of Basis for SWMU 7 issued by TtNUS	February 1999
First year of Quarterly Performance Monitoring implemented by TtNUS	April 2000
APM conducted by TtNUS	January 2002
APM conducted by TtNUS	January 2003
RCRA CAMP (Rev. 4) produced by TtNUS	July 2003
APM conducted by REA	January 2004
Five-Year Review conducted by TtNUS	December 2004
APM conducted by REA	February 2005

Table 1. Summary List of Corrective Actions at APM Sites (Continued)

SWMU 7 - Boca Chica Temporary Hazardous Waste Storage Area (Continued)	
Investigation/Activity	**Date**
APM conducted by REA	February 2006
APM conducted by REA	January 2007
APM conducted by REA	January 2008
APM conducted by OHC	January 2009
APM conducted by OHC	April 2010
APM conducted by Enviro Compliance Solutions, Inc. (ECS)	December 2011
APM conducted by ECS	December 2012
APM conducted by Battelle	December 2013
IR 1 - Truman Annex Refuse Disposal Area	
Investigation/Activity	**Date**
Refuse Disposal Area operations	1952 to mid-1960s
IAS Report produced by Envirodyne Engineers, Inc.	May 1985
Verification Study Assessment issued by G&M	March 1987
Preliminary RI Report produced by IT	January 1991
RFI/RI Report issued by IT	June 1994
IRA excavation completed by BEI	March 1996
Supplemental RFI/RI Report for Eight Sites issued by B&RE	January 1998
Sediment Toxicity Study Report produced by TtNUS	August 1999
Proposed Plan for IR 1 issued by TtNUS	February 2000
Decision Document for IR 1 and IR 8 issued by TtNUS	September 2000
First year of Quarterly Performance Monitoring implemented by TtNUS	July 2001
APM conducted by TtNUS	January 2003
IR 1 Letter Report addressing Focused Soil Investigation issued by TtNUS December 2003	December 2003
APM conducted by REA	January 2004
Five-Year Review conducted by TtNUS	December 2004
APM conducted by REA	February 2005
APM conducted by REA	February 2006
APM conducted by REA	January 2007
APM conducted by REA	January 2008
APM conducted by OHC	January 2009
APM conducted by OHC	April 2010
APM conducted by Enviro Compliance Solutions, Inc. (ECS)	December 2011
APM conducted by ECS	December 2012
APM conducted by Battelle	December 2013
IR 7 - Former Fleming Key North Landfill	
Investigation/Activity	**Date**
Fleming Key North Landfill, Navy and City of Key West operations	1952 to 1962
USDA Animal Import Center operations	1979 to 1999
IAS Report produced by Envirodyne Engineers	May 1985
Verification Study Assessment produced by G&M	March 1987
Preliminary RI Report issued by IT	January 1991
RFI/RI Report issued by IT	June 1994
IRA completed by BEI	October 1995
Supplemental RFI/RI Report for Eight Sites issued by B&RE	January 1998
Proposed Plan for IR 7 issued by TtNUS	October 1998
Decision Document and Responsiveness Summary for IR 3, IR 7, and AOC B issued by TtNUS	April 1999
First Year of Quarterly Performance Monitoring implemented by TtNUS	April 2000
APM conducted by TtNUS	January 2002
Environmental Baseline Survey conducted by TtNUS at Harry S. Truman Animal Import Center.	June 1905

Table 1. Summary List of Corrective Actions at APM Sites (Continued)

IR 7 - Former Fleming Key North Landfill (Continued)	
Investigation/Activity	**Date**
APM conducted by TtNUS	January 2003
APM conducted by REA	January 2004
Five-Year Review conducted by TtNUS	December 2004
APM conducted by REA	February 2005
APM conducted by REA	February 2006
APM conducted by REA	January 2007
APM conducted by REA	January 2008
APM conducted by OHC	January 2009
APM conducted by OHC	April 2010
APM conducted by Enviro Compliance Solutions, Inc. (ECS)	December 2011
APM conducted by ECS	December 2012
APM conducted by Battelle	December 2013
IR 8 - Former Fleming Key South Landfill	
Investigation/Activity	**Date**
Fleming Key South Landfill, Dredgers Key operations	1948 to 1951
Fleming Key South Landfill, Navy operations	1962 to 1982
Fleming Key South Landfill, Navy and City of Key West operations	1968 to 1982
IAS Report issued by Envirodyne Engineers, Inc.	May 1985
Verification Study Assessment produced by G&M	March 1987
Preliminary RI Report issued by IT	January 1991
RFI/RI Report issued by IT	June 1994
Shoreline Protection System installation completed by BEI	August 1997
Supplemental RFI/RI Report for Eight Sites issued by B&RE	January 1998
Sediment Toxicity Study Report produced by TtNUS	August 1999
Proposed Plan for IR 8 issued by TtNUS	March 2000
Decision Document for IR 1 and IR 8 issued by TtNUS	September 2000
First year of Quarterly Performance Monitoring implemented by TtNUS	July 2001
APM conducted by TtNUS	January 2003
APM conducted by REA	January 2004
Five-Year Review conducted by TtNUS	December 2004
APM conducted by REA	February 2005
APM conducted by REA	February 2006
APM conducted by REA	January 2007
APM conducted by REA	January 2008
APM conducted by OHC	January 2009
APM conducted by OHC	April 2010
APM conducted by Enviro Compliance Solutions, Inc. (ECS)	December 2011
APM conducted by ECS	December 2012
APM conducted by Battelle	December 2013

Table 2. Analytical Suites for the 2013 APM Program

Site	Media	Sample Location	Metals	VOCs	SVOCs	Pesticides	PCBs	PAHs
SWMU-1	Groundwater	S1MW-7	TAL (F)	App. IX (F)	App. IX (F)	App. IX (F)		
		S1MW-9	TAL (F)	App. IX (F)	App. IX (F)	App. IX (F)		
	Sediment	S1SD-1	TAL (F)			App. IX (F)		App. IX (R)
		S1SD-2	TAL (F)			App. IX (F)		App. IX (R)
		S1SD-3	TAL (F)			App. IX (F)		App. IX (R)
		S1SD-4	TAL (F)			App. IX (F)		App. IX (R)
		S1SD-5	TAL (F)			App. IX (F)		App. IX (R)
	Surface Water	S1SW-1	TAL (F)		App. IX (F)			
		S1SW-2	TAL (F)		App. IX (F)	App. IX (F)		
		S1SW-3	TAL (F)					
		S1SW-4	TAL (F)			App. IX (F)		
		S1SW-5	TAL (F)			App. IX (F)		
SWMU-2	Groundwater	S2MW-5	TAL (R)			App. IX (R)		
		S2MW-6	TAL (R)			App. IX (R)		
		S2MW-7	TAL (R)			App. IX (R)		
	Sediment	S2SD-1	TAL (R)			App. IX (R)		
		S2SD-2	TAL (R)			App. IX (R)		
		S2SD-3	TAL (R)			App. IX (R)		
		S2SD-4	TAL (R)			App. IX (R)		
		S2SD-5	TAL (R)			App. IX (R)		
	Surface Water	S2SW-1	TAL (R)			App. IX (R)		
		S2SW-2	TAL (R)			App. IX (R)		
		S2SW-3	TAL (R)			App. IX (R)		
		S2SW-4	TAL (R)			App. IX (R)		
		S2SW-5	TAL (R)			App. IX (R)		
SWMU-5	Sediment	S5SD-1	TAL (R)					
		S5SD-2	TAL (R)					
	Surface Water	S5SW-1	TAL (R)					
		S5SW-2	TAL (R)					
		S5SW-3	TAL (R)					
SWMU-7	Sediment	S7SD-5	TAL (R)			App. IX (R)	App. IX (R)	App. IX (R)
		S7SD-6	TAL (R)			App. IX (R)	App. IX (R)	App. IX (R)
		S7SD-8	TAL (R)			App. IX (R)		App. IX (R)
	Surface Water	S7SW-5	TAL (R)			App. IX (R)	App. IX (R)	
		S7SW-6	TAL (R)			App. IX (R)	App. IX (R)	
		S7SW-8	TAL (R)			App. IX (R)		
IR-1	Groundwater	I1MW-1	TAL (R)					
		I1MW1-1	TAL (R)					
		I1MW1-2R	TAL (R)					
		I1MW-3	TAL (R)					
	Sediment	I1SD-1	TAL (F)			TCL (F)	TCL (F)	App. IX (F)
		I1SD-2	TAL (F)			TCL (F)	TCL (F)	App. IX (F)
		I1SD-3	TAL (F)			TCL (F)	TCL (F)	App. IX (F)
		I1SD-4	TAL (F)			TCL (F)	TCL (F)	App. IX (F)
		I1SD-5	TAL (F)			TCL (F)	TCL (F)	App. IX (F)
		I1SD-6	TAL (F)			TCL (F)	TCL (F)	App. IX (F)
		I1SD-7	TAL (F)			TCL (F)	TCL (F)	App. IX (F)
		I1SD-8	TAL (F)			TCL (F)	TCL (F)	App. IX (F)
IR-7	Groundwater	I7MW7-3	TAL (R)					

Table 2. Analytical Suites for the 2013 APM Program (Continued)

Site	Media	Sample Location	Metals	VOCs	SVOCs	Pesticides	PCBs	PAHs
IR-8	Groundwater	I8MW8-1	TAL (R)					
		I8MW8-2	TAL (R)					

TAL - target analyte list
TCL - target compound list
App. IX - 40 Code of Federal Regulations Part 264 Appendix IX, Groundwater Monitoring List
(F) - Full list of analytes (see PMP Addendum [Battelle, 2012])
(R) - Reduced list of analytes (see PMP Addendum [Battelle, 2012])

Table 3. APM Optimization Rules

In accordance with the July 2012 NAS Key West Partnering Team Consensus Item (stated below) and the Annual Performance Monitoring (APM) optimization discussions held during the October 2012 and July 2013 NAS Key West Partnering Team Meetings, optimizations to the APM Performance Monitoring Plan (PMP) were developed to incorporate data only from monitoring events performed in 2003, 2010, 2011 and 2012. The criteria for eliminating analytes are summarized in the list below.
Consensus Item:
"The team agrees to reduce the list of analytes for the APM sites. The rationale for the reduced list of analytes includes: eliminating analytes that did not exceed action levels from the 1997 Appendix B – Part 2 BRAC SI Action Levels for two consecutive sampling events from years 2003, 2010, and 2011. Remove analyte if no exceedance of the action levels during the past 2 sampling events. For analytes where only one sampling event has been performed, if the result is above action levels, then further sampling will be performed; otherwise the analyte will be eliminated. For analytes that do not have action levels, the analyte will be eliminated if below the FDEP PQL table and retained if above the FDEP PQL table. Exceedances of the FDEP PQLs will be discussed by the Partnering Team."
July 2012 APM Optimization
Criteria for eliminating analytes from the annual performance monitoring program: 1. Only consider data from 2003, 2010 and 2011. 2. If a compound (analyte) has never been analyzed or has never been detected, and is not part of the original PMP, then the compound is eliminated (e.g., PCBs in sediment and groundwater). 3. If a compound has been analyzed only once and is either non-detect, or below the respective action level or PQL, then the compound is eliminated. Replaced by October 2012 revision 3a below. 4. If a compound has been analyzed in two or more monitoring events, and the results from the two most recent events are either non-detect, or below the respective action level or PQL, then the compound is eliminated. 5. If any of these conditions from criteria 2 through 4 are not met, then the compound is retained for further discussion by the partnering team.
October 2012 Partnering Team Comment on Consensus Item and Criteria for Eliminating Analytes from the APM Program
3a. If a compound has been analyzed only once and is below the respective action level or PQL, then the compound is discussed by the partnering team. This rule replaces rule #3 from July 2012.
October 2012 Modifications to the APM Optimization
6. If the reporting level is above the action level in the 2010 and 2011 events, then retain the analyte (demarcated in the optimization worksheet retention columns as "yes").
7. Evaluate the possibility that laboratory reporting limits are able to meet detection limits.
8. If a monitoring well is a sentinel well located near a surface water body, groundwater as well as surface water action levels must be used in the analyte evaluation.
9. If an analyte has a non-detect value ("U" qualifier) and the reporting limit is below the action level for groundwater at all sites (including landfill), and surface water/sediment at non-landfill sites across the board, then do not retain the analyte.
10. At landfill sites, surface water and sediment will require monitoring per the SOB with a future path to be determined through future optimization activities. Replaced by July 2013 revision 10a below.
11. Through optimization, if an analyte is retained at a particular location, then that analyte is analyzed at all locations at that site for that particular media (As an example of an exception, of which there are others, the PCBs at SWMU 7 will be sampled in only two of three locations [S7SW-05 and -06] due to the 2002 PMP addendum).
12. Surface water and sediment data from the Post Storm Surge Report (2007) for SWMU-1, -2, and -5 will be considered in the optimization effort.
13. For IR-1 sediment, analyze for metals, PAHs, PCBs, and pesticides as performed in 2003 per the PMP Addendum (2002). Noting IR 1 because currently only one data set (2003) is used in the optimization spreadsheet; sampling was not performed in 2010 and 2011.

Table 3. APM Optimization Rules (Continued)

October 2012 Modifications to the APM Optimization (Continued)
14. Develop a PMP addendum to incorporate the analyte reductions performed during the October 2012 Partnering Team Meeting and provide to NAVFAC and FDEP prior to 2012 APM sampling (December 2012).
15. Add PMP addendum (of 2012) as an appendix to the next APM report and to the SAP addendum (to be finalized prior to December 2012 sampling).
16. After the next round of sampling is performed (December 2012), the results will be used to perform additional optimization of the analyte lists. The PMP will be updated based on results of optimization (considering additional optimization performed using results of the December 2012 sampling event).
17. Each column in the optimization spreadsheets is representative of requirements for a specific well or sampling location. A column will be added at the end of each spreadsheet to capture the compounds that will be analyzed for each media at each site. These final columns will be reflected in the Retention Summary worksheet.
18. Develop a flow-chart, using 62-780 as a basis, for each site to accelerate and optimize the path forward for NFA determination.
July 2013 Modifications to the APM Optimization
10a. At landfill sites, all media will require monitoring per the SOB (regardless of exceedances or not), plus any analytes having exceedances of action levels outside of the SOB. Any exceedances outside of the SOB, the partnering team will have discussions to determine if the analyte is site related. For analytes outside of the SOB, that do not have exceedances, the analyte will be dropped per previous consensus rules. This rule replaces rule #10 from October 2012.

Table 4. 2013 APM Optimization Summary

SWMU-1 Analyte List Optimization Summary						
Media	**Analytical Program**	**Number of Analytes in the 2013 PMP Addendum**	**Number of Analytes Retained**	**Number of Analytes Removed**	**Analytes Retained Following 2013 APM Optimization**	**Analytes Qualified for Removal Following 2013 APM Optimization**
Groundwater	Metals	24	24	0	Full suite of TAL metals plus tin	No analytes removed
	VOCs	59	59	0	Full suite of Appendix IX VOCs (see worksheet for full list)	No analytes removed
	SVOCs	124	124	0	Full suite of Appendix IX SVOCs (see worksheet for full list)	No analytes removed
	Pesticides	20	20	0	Full suite of Appendix IX pesticides (see worksheet for full list)	No analytes removed
Surface Water	Metals	24	24	0	Full suite of TAL metals plus tin	No analytes removed
	SVOCs	124	124	0	Full suite of Appendix IX SVOCs at locations -01 and -02 (see worksheet for full list)	No analytes removed
	Pesticides	20	20	0	Full suite of Appendix IX pesticides at locations -02, -04 and -05 (see worksheet for full list)	No analytes removed
Sediment	Metals	24	24	0	Full suite of TAL metals plus tin	No analytes removed
	SVOCs	17	17	0	Full suite of Appendix IX PAHs	No analytes removed
	Pesticides	20	20	0	Full suite of Appendix IX pesticides (see worksheet for full list)	No analytes removed
SWMU-2 Analyte List Optimization Summary						
Groundwater	Metals	1	1	0	tin	No analytes removed
	VOCs	0	0	0	none	Analytical suite discontinued after the 2011 APM
	Pesticides	15	2	13	4,4'-DDD and 4,4'-DDE	Remainder of the reduced list of Appendix IX pesticides (see worksheet for full list)
Surface Water	Metals	5	1	4	tin	beryllium, copper, iron, thallium
	Pesticides	13	1	12	4,4'-DDT	Remainder of the reduced list of Appendix IX pesticides (see worksheet for full list)
	Cyanide	0	0		none	Analytical suite discontinued after the 2011 APM
Sediment	Metals	14	8	6	beryllium, cadmium, cobalt, copper, iron, lead, mercury, tin	aluminum, arsenic, selenium, silver, vanadium, zinc
	Pesticides	16	14	2	Reduced list of Appendix IX pesticides (see worksheet for full list)	chlordane, heptachlor epoxide

Table 4. 2013 APM Optimization Summary (Continued)

Media	Analytical Program	Number of Analytes in the 2013 PMP Addendum	Number of Analytes Retained	Number of Analytes Removed	Analytes Retained Following 2013 APM Optimization	Analytes Qualified for Removal Following 2013 APM Optimization
SWMU-2 Analyte List Optimization Summary (Continued)						
	Cyanide	0	0		none	Analytical suite discontinued after the 2011 APM
SWMU-5 Analyte List Optimization Summary						
Surface Water	Metals	6	2	4	beryllium, tin	copper, iron, mercury, nickel
Sediment	Metals	7	3	4	cadmium, cobalt, tin	beryllium, selenium, silver, vanadium
SWMU-7 Analyte List Optimization Summary						
Surface Water	Metals	5	3	2	copper, manganese, tin	beryllium, mercury
	Pesticides/PCBs	27	0	27	none	Remainder of the reduced list of Appendix IX pesticides (see worksheet for full list); Full suite of Appendix IX PCBs (at locations -05 and -06)
Sediment	Metals	13	11	2	aluminum, beryllium, cadmium, cobalt, copper, iron, lead, mercury, silver, tin, zinc	selenium, vanadium
	SVOCs	1	1	0	benzo[b]fluoranthene	
	Pesticides/PCBs	21	20	1	Reduced list of Appendix IX pesticides (see worksheet for full list); Full suite of Appendix IX PCBs (at locations -05 and -06)	methoxychlor
IR-1 Analyte List Optimization Summary						
Groundwater	Metals	9	9	0	Reduced list of TAL metals plus tin	No analytes removed
Sediment	Metals	24	24	0	Full suite of TAL metals plus tin	No analytes removed
	PAHs	18	18	0	Full suite of TCL PAHs	No analytes removed
	Pesticides/PCBs	27	27	0	Full suite of TCL pesticides and PCBs	No analytes removed
IR-7 Analyte List Optimization Summary						
Groundwater	Metals	9	9	0	Reduced list of TAL metals plus tin	No analytes removed
IR-8 Analyte List Optimization Summary						
Groundwater	Metals	11	11	0	Reduced list of TAL metals plus tin	No analytes removed

Table 5. SWMU-1 Groundwater Metals

Inorganics	Action Level (Groundwater)	PQL (Ground-water)	Action Level (Surface Water)	PQL (Surface Water)	Retained for PMP Modification Nov-12	Method	Units	App B	TAL	Location						
										S1MW-07						
										Date Collected						Jan-14
										Jan-03	Jan-03 DUP	Oct-10	Dec-11	Dec-12	Dec-13	Retain
Aluminum	37,000		1,500		yes	6010B	µg/L	x	x	96.3U	96.3U	100U		50 U	250 U	no
Antimony	6		4,300		yes	6020	µg/L	x	x	4.0U	3.6U	2.0U		2.0 U	2 U	no
Arsenic	50		50		yes	6010B	µg/L	x	x	11.6	8.2	130		120	140	yes
Barium	2,000		10,000		yes	6010B	µg/L	x	x	23.4	26.2	30		31	24	no
Beryllium	4		0.28		yes	6010B	µg/L	x	x	1.6U	1.6U	0.2U	5.0U	0.25 U	0.25 U	no
Cadmium	5		9.3		yes	6010B	µg/L	x	x	13.0U	13.0U	2.0U	5.0U	0.20 U	0.2 U	no
Calcium					yes	6010B	µg/L	x	x	576,000	582,000	540,000		440,000	500000 J	no
Chromium	100		50		yes	6010B	µg/L	x	x	2.3U	2.2U	1.4J		7.6 J	13 U	no
Cobalt	2,200		35,000		yes	6010B	µg/L	x	x	1.7U	1.7U	2.0U		0.84	1.4 J	no
Copper	1,500		2.9		yes	6010B	µg/L	x	x	11.9U	11.9U	2.0U	50U	1.1 U	5.5 U	yes
Iron	11,000		300		yes	6010B	µg/L	x	x	111U	156U	230		82 J	220 U	no
Lead	15		5.6		yes	6010B	µg/L	x	x	2.6U	2.6U	4.0U		0.50 U	0.5 U	no
Magnesium					yes	6010B	µg/L	x	x	1,100,000	1,110,000	960,000D		1,700,000	1,100,000	no
Manganese	840		10		yes	6010B	µg/L	x	x	2.9U	2.9U	15	25JD	24	19 J	yes
Mercury	2		1.26		yes	7470A	µg/L	x	x	0.09U	0.10U	0.10U	8U	0.10 UJ	0.1 U	no
Nickel	100		8.3		yes	6010B	µg/L	x	x	50.9U	50.9U	8.8J		4.3 J	10 U	yes
Potassium					yes	6010B	µg/L	x	x	348,000	347,000	330,000D		430,000	320,000	no
Selenium	50		71		yes	6010B	µg/L	x	x	6.4U	6.4U	8.0U		1.1 U	5.5 U	no
Silver	180		2.3		yes	6010B	µg/L	x	x	12.3U	12.3U	1.6U		0.25 U	0.25 U	no
Sodium	160,000				yes	6010B	µg/L	x	x	8,410,000	8,200,000	9,400,000D		14,000,000	8,300,000	yes
Thallium	4.62		7.3		yes	6020	µg/L	x	x	8.6U	8.6U	0.25U		0.25 U	0.25 U	no
Tin	22,000		0.01		yes	6010B	µg/L	x		6.0U	6.0U		50U	1.4 U	1.4 U	yes
Vanadium	260		10,000		yes	6010B	µg/L	x	x	25.9U	25.9U	2.4U	100U	3.2 U	16 U	no
Zinc	11,000		86		yes	6010B	µg/L	x	x	11.0U	6.1U	10U		12 J	42 U	no

Table 5. SWMU-1 Groundwater Metals (Continued)

Inorganics	Action Level (Ground-water)	PQL (Ground-water)	Action Level (Surface Water)	PQL (Surface Water)	Retained for PMP Modification Nov-12	Method	Units	App B	TAL	Location							Retained for PMP Modification Apr-14
										S1MW-09							
										Date Collected						Jan-14	
										Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Dec-13 DUP	Retain	
Aluminum	37,000		1,500		yes	6010B	µg/L	x	x		100U		50 U	250 U	250 U	no	yes
Antimony	6		4,300		yes	6020	µg/L	x	x		2.0U		2.0 U	2 U	2 U	no	yes
Arsenic	50		50		yes	6010B	µg/L	x	x		8.0U		1.8 J	6.5 U	6.5 U	no	yes
Barium	2,000		10,000		yes	6010B	µg/L	x	x		54		59	58	59	no	yes
Beryllium	4		0.28		yes	6010B	µg/L	x	x		0.20U	5.0U	0.25 U	0.25 U	0.25 U	no	yes
Cadmium	5		9.3		yes	6010B	µg/L	x	x		2.0U	5.0U	0.20 U	0.2 U	0.2 U	no	yes
Calcium					yes	6010B	µg/L	x	x		380,000		330,000	410,000 J	410,000 J	no	yes
Chromium	100		50		yes	6010B	µg/L	x	x		2.0U		2.5 U	13 U	13 U	no	yes
Cobalt	2,200		35,000		yes	6010B	µg/L	x	x		2.0U		0.61	1.2 J	1.4 J	no	yes
Copper	1,500		2.9		yes	6010B	µg/L	x	x		2.0U	50U	1.1 U	5.5 U	5.5 U	yes	yes
Iron	11,000		300		yes	6010B	µg/L	x	x		1,100		260	400 J	580 J	yes	yes
Lead	15		5.6		yes	6010B	µg/L	x	x		4.0U		0.50 U	0.5 U	0.5 U	no	yes
Magnesium					yes	6010B	µg/L	x	x		1,300,000D		1,300,000 J	1,400,000 J	1,400,000 J	no	yes
Manganese	840		10		yes	6010B	µg/L	x	x		96	86D	81	79	79	yes	yes
Mercury	2		1.26		yes	7470A	µg/L	x	x		0.10U	8.0U	0.10 UJ	0.1 U	0.1 U	no	yes
Nickel	100		8.3		yes	6010B	µg/L	x	x		4.0U		2.0 U	10 U	10 U	yes	yes
Potassium					yes	6010B	µg/L	x	x		430,000D		440,000	370,000 J	390,000	no	yes
Selenium	50		71		yes	6010B	µg/L	x	x		8.0U		1.1 U	5.5 U	5.5 U	no	yes
Silver	180		2.3		yes	6010B	µg/L	x	x		1.6U		0.25 U	0.25 U	0.25 U	no	yes
Sodium	160,000				yes	6010B	µg/L	x	x		12,000,000D		11,000,000 J	11,000,000 J	11,000,000 J	yes	yes
Thallium	4.62		7.3		yes	6020	µg/L	x	x		0.25U		0.25 U	0.25 U	0.25 U	no	yes
Tin	22,000		0.01		yes	6010B	µg/L	x				50U	1.4 U	1.4 U	1.4 U	yes	yes
Vanadium	260		10,000		yes	6010B	µg/L	x	x		2.4U	100U	3.2 U	16 U	16 U	no	yes
Zinc	11,000		86		yes	6010B	µg/L	x	x		16J		15 J	42 U	42 U	no	yes

Not a Target Analyte List (TAL) Metal
Detected below Action level
Reporting limit above Action level
Detected above Surface Water Action level
Detected above Groundwater Action level
Compound retained during optimization analysis
* Sodium concentrations reflect seawater values (i.e., near 10,700,000 µg/L)
No Available Data

Action Level and Appendix B (App B) Compounds (B&RE, 1998)
Target Analyte List (TAL) Compounds (B&RE, 1998)

Qualifiers:

D	Dilution Result
J	Estimated concentration
U	Non-detect, Reporting limit estimated

Table 6. SWMU-1 Groundwater Volatile Organic Compounds (VOCs)

VOCs	Action Level (Ground-Water)	PQL (Ground-water)	Action Level (Surface-Water)	PQL (Surface Water)	Retained for PMP Mod Nov-12	Method	Units	App B	App IX	Location S1MW-07 Date Collected Jan-03	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Jan-14 Retain	Location S1MW-09 Date Collected Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Dec-13 DUP	Jan-14 Retain	Retained for PMP Modification Apr-14
1,1,1,2-Tetrachloroethane	0.5				yes	8260B	µg/L		x	5U	5U	0.33 U		0.33 U	0.33 U	no		0.33 U		0.33 U	0.33 U	0.33 U	no	yes
1,1,1-Trichloroethane	200		312		yes	8260B	µg/L	x	x	5U	5U	0.50 U		0.50 U	0.5 U	no		0.50 U		0.50 U	0.5 U	0.5 U	no	yes
1,1,2,2-Tetrachloroethane	0.052	2	10.8		yes	8260B	µg/L	x	x	5U	5U	0.25 U		0.25 U	0.25 U	no		0.25 U		0.25 U	0.25 U	0.25 U	no	yes
1,1,2-Trichloroethane	5		940		yes	8260B	µg/L	x	x	5U	5U	0.25 U		0.25 U	0.25 U	no		0.25 U		0.25 U	0.25 U	0.25 U	no	yes
1,1-Dichloroethane	810		160,000		yes	8260B	µg/L	x	x	5U	5U	0.25 U		0.25 U	0.25 U	no		0.25 U		0.25 U	0.25 U	0.25 U	no	yes
1,1-Dichloroethene	7		3.2		yes	8260B	µg/L	x	x	5U	5U	0.25 U		0.25 U	0.25 U	no		0.25 U		0.25 U	0.25 U	0.25 U	no	yes
1,2,3-Trichloropropane	0.00065				yes	8260B	µg/L		x	5U	5U	0.50 U		0.5 U	0.5 U	yes		0.50 U		0.5 U	0.5 U	0.5 U	yes	yes
1,2-Dibromo-3-chloropropane	0.2				yes	8260B	µg/L		x	5U	5U	1.0 U		1.0 UJ	1 U	yes		1.0 U		1.0 UJ	1 U	1 U	yes	yes
1,2-Dibromoethane (Ethylene dibromide)	0.05				yes	8260B	µg/L		x	5U	5U	0.25 U		0.25 U	0.25 U	yes		0.25 U		0.25 U	0.25 U	0.25 U	yes	yes
1,2-Dichloroethane (Ethylene dichloride)	3		1,130		yes	8260B	µg/L	x	x	5U	5U	0.25 U		0.25 U	0.25 U	no		0.25 U		0.25 U	0.25 U	0.25 U	no	yes
1,2-Dichloropropane	5		525		yes	8260B	µg/L	x	x	5U	5U	0.25U		0.25 U	0.25 U	no		0.25 U		0.25 U	0.25 U	0.25 U	no	yes
1,4-Dioxane	0.67	10			yes	8260B	µg/L		x	100UR	100UR	0.31 U		50 U	50 U	yes		0.31 U		50 U	50 U	50 U	yes	yes
2-Butanone (Methyl ethyl ketone [MEK])	1,900		3,220,000		yes	8260B	µg/L	x	x	10U	10U	1.0 U		1.0 U	1 U	no		1.0 U		1.0 U	1 U	1 U	no	yes
2-Hexanone	34		428,000		yes	8260B	µg/L	x	x	10U	10U	1.0 U		1.0 U	1 U	no		1.0 U		1.0 U	1 U	1 U	no	yes
3-Chloro-1-propene (Allyl Chloride)	0.63				yes	8260B	µg/L		x	10U	10U	0.50 U		0.50 U	0.5 U	no		0.50 U		0.50 U	0.5 U	0.5 U	no	yes
4-Methyl-2-pentanone (Methyl isobutyl ketone)	2,900		460,000		yes	8260B	µg/L	x	x	10U	10U	1.0 U		1.0 U	1 U	no		1.0 U		1.0 U	1 U	1 U	no	yes
Acetone (2-Propanone)	3,700		90,000,000		yes	8260B	µg/L	x	x	10UR	10UR	5.0 U		5.0 U	5 U	no		5.0 U		5.0 U	5 U	5 U	no	yes
Acetonitrile	130		160		yes	8260B	µg/L		x	50UR	50UR	10 U		10 U	10 U	no		10 U		10 U	10 U	10 U	no	yes
Acrolein	0.041	20	0.1	20	yes	8260B	µg/L		x	50UR	50UR	7.4 U		7.4 UJ	7.4 UJ	no		7.4 U		7.4 UJ	7.4 UJ	7.4 UJ	no	yes
Acrylonitrile	0.045	20	2,600	20	yes	8260B	µg/L		x	10U	10U	7.2 U		7.2 UJ	7.2 UJ	no		7.2 U		7.2 UJ	7.2 UJ	7.2 UJ	no	yes
Benzene	1		71.28		yes	8260B	µg/L	x	x	5U	5U	0.25 U		0.25 U	0.25 U	no		0.25 U		0.25 U	0.25 U	0.25 U	no	yes
Bromodichloromethane (Dichlorobromomethane)	100	2	22		yes	8260B	µg/L	x	x	5U	5U	0.25 U		0.25 U	0.25 U	no		0.25 U		0.25 U	0.25 U	0.25 U	no	yes
Bromoform	100		360		yes	8260B	µg/L	x	x	5U	5U	0.50 U		0.50 U	0.5 U	no		0.50 U		0.50 U	0.5 U	0.5 U	no	yes
Bromomethane	8.7		110		yes	8260B	µg/L	x	x	5U	5U	0.80 U		0.80 UJ	2.5 U	no		0.80 U		0.80 UJ	2.5 U	2.5 U	no	yes
Carbon disulfide	1,000		2		yes	8260B	µg/L	x	x	5U	5U	0.60 U		0.60 U	0.6 U	no		0.60 U		0.60 U	0.6 U	0.6 U	no	yes
Carbon tetrachloride	3		4.42		yes	8260B	µg/L	x	x	5U	5U	0.50 U		0.50 U	0.5 U	no		0.50 U		0.50 U	0.5 U	0.5 U	no	yes
Chlorobenzene	100		50		yes	8260B	µg/L	x	x	5U	5U	0.25 U		0.25 U	0.25 U	no		0.25 U		0.25 U	0.25 U	0.25 U	no	yes
Chlorodibromomethane (Dibromochloromethane)	100	2	34		yes	8260B	µg/L	x	x	5U	5U	0.25 U		0.25 U	0.25 U	no		0.25 U		0.25 U	0.25 U	0.25 U	no	yes
Chloroethane	8,600		8,600		yes	8260B	µg/L	x	x	5U	5U	1.0 U		1.0 U	2.5 U	no		1.0 U		1.0 U	2.5 U	2.5 U	no	yes
Chloroform	100		470.8		yes	8260B	µg/L	x	x	5U	5U	0.25 U		0.25 U	0.25 U	no		0.25 U		0.25 U	0.25 U	0.25 U	no	yes
Chloromethane	1.4		470.8		yes	8260B	µg/L	x	x	5U	5U	0.33 U		0.33 U	0.33 U	no		0.33 U		0.33 U	0.33 U	0.33 U	no	yes
Chloroprene (2-Chloro-1,3-butadiene)	0.016				yes	8260B	µg/L		x	10U	10U	0.30 U		0.3 U	0.3 U	yes		0.30 U		0.3 U	0.3 U	0.3 U	yes	yes
cis-1,2-dichloroethene	70		11,600		yes	8260B	µg/L	x	x	5U	5U			0.25 U	0.25 U	no				0.25 U	0.25 U	0.25 U	no	yes
cis-1,3-Dichloropropene	0.077	2	7.9		yes	8260B	µg/L	x	x	5U	5U	0.25 U		0.25 U	0.25 UJ	no		0.25 U		0.25 U	0.25 UJ	0.25 UJ	no	yes
Dibromomethane	7.9		6,400		yes	8260B	µg/L		x	5U	5U	0.25 U		0.25 U	0.25 U	no		0.25 U		0.25 U	0.25 U	0.25 U	no	yes
Dichlorodifluoromethane	190				yes	8260B	µg/L		x	5U	5U	0.25 U		0.25 UJ	0.25 UJ	no		0.25 U		0.25 UJ	0.25 UJ	0.25 UJ	no	yes
Ethyl Methacrylate	420				yes	8260B	µg/L		x	10U	10U	0.25 U		0.25 U	0.25 UJ	no		0.25 U		0.25 U	0.25 UJ	0.25 UJ	no	yes
Ethylbenzene	700		4.3		yes	8260B	µg/L	x	x	5U	5U	0.25 U		0.25 U	0.25 U	no		0.25 U		0.25 U	0.25 U	0.25 U	no	yes
Isobutyl alcohol	4,600				yes	8260B	µg/L		x	100UR	100UR	20 U		20 UJ	20 UJ	no		20 U		20 UJ	20 UJ	20 UJ	no	yes
M+P-Xylenes *(see total xylenes)*			1.8		no	8260B	µg/L		x	5U	5U					no							no	yes
Methacrylonitrile	0.75	10			yes	8260B	µg/L		x	50U	50U	5.0 U		5.0 U	5 UJ	no		5.0 U		5.0 U	5 UJ	5 UJ	no	yes
Methyl iodide (Iodomethane)					yes	8260B	µg/L		x	10U	10U	1.0 U		1.0 U	1 UJ	no		1.0 U		1.0 U	1 UJ	1 UJ	no	yes
Methyl Methacrylate	1,400				yes	8260B	µg/L		x	10U	10U	0.50 U		0.50 U	0.5 UJ	no		0.50 U		0.50 U	0.5 UJ	0.5 UJ	no	yes
Methylene chloride	5		1,580		yes	8260B	µg/L	x	x	5U	5U	1.0 U		1.0 U	1 U	no		1.0 U		1.0 U	1 U	1 U	no	yes
O-Xylene *(see total xylenes)*			350		no	8260B	µg/L		x	5U	5U					no							no	yes
Pentachloroethane	0.56		281		yes	8260B	µg/L		x	10U	10U	1.2 U		1.2 UJ	1.2 UJ	yes		1.2 U		1.2 UJ	1.2 UJ	1.2 UJ	yes	yes
Propionitrile (Ethyl cyanide)					yes	8260B	µg/L		x	50UR	50UR	5.0 U		5.0 U	5 UJ	no		5.0 U		5.0 U	5 UJ	5 UJ	no	yes
Styrene	100		100		yes	8260B	µg/L	x	x	5U	5U	0.25 U		0.25 U	0.25 U	no		0.25 U		0.25 U	0.25 U	0.25 U	no	yes
Tetrachloroethene	3		8.85		yes	8260B	µg/L	x	x	5U	5U	0.25 U		0.25 U	0.25 U	no		0.25 U		0.25 U	0.25 U	0.25 U	no	yes
Toluene	1,000		37		yes	8260B	µg/L	x	x	5U	5U	0.33 U		0.33 U	0.33 U	no		0.33 U		0.33 U	0.33 U	0.33 U	no	yes
Total 1,2-Dichloroethene *(see cis- and trans-)*			590		no	8260B	µg/L		x	5U	5U					no							no	yes
trans-1,2-Dichloroethene	100		1,350		yes	8260B	µg/L	x	x	5U	5U	0.25 U		0.25 U	0.25 U	no		0.25 U		0.25 U	0.25 U	0.25 U	no	yes
trans-1,3-Dichloropropene	0.077		7.9		yes	8260B	µg/L	x	x	5U	5U	0.25 U		0.25 U	0.25 UJ	yes		0.25 U		0.25 U	0.25 UJ	0.25 UJ	yes	yes
trans-1,4-Dichloro-2-butene	0.0012				yes	8260B	µg/L		x	10U	10U	1.0 U		1.0 UJ	1 U	yes		1.0 U		1.0 UJ	1 U	1 U	yes	yes
Trichloroethene	3		80.7		yes	8260B	µg/L	x	x	5U	5U	0.25 U		0.25 U	0.25 U	no		0.25 U		0.25 U	0.25 U	0.25 U	no	yes
Trichlorofluoromethane	1,100		6,400		yes	8260B	µg/L		x	5U	5U	0.25 U		0.25 U	0.25 U	no		0.25 U		0.25 U	0.25 U	0.25 U	no	yes
Vinyl acetate	410		16		yes	8260B	µg/L		x	5U	5U	0.50 U		0.50 UJ	0.5 UJ	no		0.50 U		0.5 UJ	0.5 UJ	0.5 UJ	no	yes
Vinyl chloride	1		11,600		yes	8260B	µg/L	x	x	2U	2U	0.50 U		0.50 U	0.5 U	no		0.50 U		0.50 U	0.5 U	0.5 U	no	yes

Table 6. SWMU-1 Groundwater Volatile Organic Compounds (VOCs) (Continued)

VOCs	Action Level (Ground-Water)	PQL (Ground-water)	Action Level (Surface-Water)	PQL (Surface Water)	Retained for PMP Mod Nov-12	Method	Units	App B	App IX	Location							Location							Retained for PMP Modification Apr-14
										S1MW-07							S1MW-09							
										Date Collected						Jan-14	Date Collected						Jan-14	
										Jan-03	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Dec-13 DUP	Retain	
Total Xylenes	10,000		6,000		yes	8260B	µg/L	x	x	5U	5U	0.75 U		0.75 U	0.75 U	no		0.75 U		0.75 U	0.75 U	0.75 U	no	yes

Not an Appendix B Compound
U.S. EPA Regional Screening Level (2012) Tap Water value
U.S. EPA Regional Screening Level (2012) Maximum Contaminant Level value
NOAA SQuiRTs
Reporting limit above Action level
Reporting limit above Action level but below PQL
Compound retained during optimization analysis
No Available Data
Action Level and Appendix B (App B) Compounds (B&RE, 1998)
Appendix IX (App IX) Compounds from 40CFR Part 264 Appendix IX

Qualifiers:

J – Estimated Concentration
U – Non-Detect, Reporting Limit Estimated
UJ – Non-Detect, Analyte Rejected
UR – Analytical Results is Rejected

Table 7. SWMU-1 Groundwater Semi-Volatile Organic Compounds (SVOCs)

SVOCs	Action Level (Ground-Water)	PQL (Ground-water)	Action Level (Surface-Water)	PQL (Surface Water)	Retained for PMP Mod Nov-12	Method	Units	App B	App IX	Location S1MW-07 Date Collected Jan-03	Location S1MW-07 Date Collected Jan-03	Location S1MW-07 Date Collected Oct-10	Location S1MW-07 Date Collected Dec-11	Location S1MW-07 Date Collected Dec-12	Location S1MW-07 Date Collected Dec-13	Location S1MW-07 Jan-14 Retain	Location S1MW-09 Date Collected Jan-03	Location S1MW-09 Date Collected Oct-10	Location S1MW-09 Date Collected Dec-11	Location S1MW-09 Date Collected Dec-12	Location S1MW-09 Date Collected Dec-13	Location S1MW-09 Date Collected Dec-13Dup	Location S1MW-09 Jan-14 Retain	Retained for PMP Mod Apr-14
1,1'-Biphenyl	0.83		14		yes	8270C	µg/L					0.10 U		0.093 U	0.094 U	no		0.10 U		0.096 U	0.099 U	0.094 U	no	yes
1,2,4,5-Tetrachlorobenzene	1.2	10	10	10	yes	8270C	µg/L		x	10U	10U	0.10 U		0.093 U	0.094 U	no		0.10 U		0.096 U	0.099 UJ	0.094 U	no	yes
1,2,4-Trichlorobenzene	70		4.5		yes	8270C	µg/L	x	x	10U	10U	0.10 U		0.093 U	0.094 U	no		0.10 U		0.096 UJ	0.099 U	0.094 U	no	yes
1,2-Dichlorobenzene	600		15.8		yes	8270C	µg/L	x	x	10U	10U	0.10 U		0.093 U	0.094 U	no		0.10 U		0.096 UJ	0.099 U	0.094 U	no	yes
1,2-Diphenylhydrazine (as Azobenzene)	0.067	10	27		yes	8270C	µg/L		x	20U	20U			0.093 U	0.094 U	no				0.096 U	0.099 U	0.094 U	no	yes
1,3,5-Trinitrobenzene/sym-Trinitrobenzene	460				yes	8270C	µg/L		x	10U	10U	0.5 U		0.47 U	0.47 U	no		0.50 U		0.48 U	0.49 U	0.47 U	no	yes
1,3-Dichlorobenzene	540		28.5		yes	8270C	µg/L	x	x	10U	10U	0.10 U		0.093 U	0.094 U	no		0.10 U		0.096 UJ	0.099 U	0.094 U	no	yes
1,3-Dinitrobenzene/m-dinitrobenzene	1.5				yes	8270C	µg/L		x	10U	10U	0.10 U		0.093 U	0.094 U	no		0.10 U		0.096 U	0.099 U	0.094 U	no	yes
1,4-Dichlorobenzene	0.44		11.2		yes	8270C	µg/L	x	x	10U	10U	0.10 U		0.093 U	0.094 U	no		0.10 U		0.096 UJ	0.099 U	0.094 U	no	yes
1,4-Naphthoquinone					yes	8270C	µg/L		x	10U	10U	0.50 UJ		0.47 UJ	0.47 UJ	no		0.50 U		0.48 UJ	0.49 UJ	0.47 UJ	no	yes
1,4-Phenylenediamine /p-phenylene diamine	3,000				yes	8270C	µg/L		x	10U	10U	16 U		15 R	15 UJ	no		16 U		15 R	16 R	15 R	no	yes
1-Naphthylamine					yes	8270C	µg/L		x	10U	10U			1.2 U	1.2 UJ	no				1.3 R	1.3R	1.2 R	no	yes
2,2'-oxybis[1-chloropropane]/Bis(2-chloroisopropyl)ether	10		10		yes	8270C	µg/L		x	10U	10U	0.10 U		0.093 U	0.094 UJ	no		0.10 U		0.096 U	0.099 UJ	0.094 UJ	no	yes
2,3,4,6-Tetrachlorophenol	170		44	50	yes	8270C	µg/L		x	10U	10U	0.10 U		0.093 U	0.094 U	no		0.10 U		0.096 U	0.099 U	0.094 U	no	yes
2,4,5-Trichlorophenol	3,700	10	11		yes	8270C	µg/L	x	x	25U	25U	0.12 U		0.11 U	0.11 U	no		0.12 U		0.12 U	0.12 U	0.11 U	no	yes
2,4,6-Trichlorophenol	6.1	10	6.5	10	yes	8270C	µg/L	x	x	10U	10U	0.17 U		0.16 U	0.16 U	no		0.17 U		0.16 U	0.17 U	0.16 U	no	yes
2,4-Dichlorophenol	110	10	790		yes	8270C	µg/L	x	x	10U	10U	0.10 U		0.093 U	0.094 U	no		0.10 U		0.096 U	0.099 U	0.094 U	no	yes
2,4-Dimethylphenol	730		21.2		yes	8270C	µg/L	x	x	10U	10U	0.69 U		0.64 U	0.65 U	no		0.69 U		0.66 U	0.68 U	0.65 U	no	yes
2,4-Dinitrophenol	73	60	15		yes	8270C	µg/L	x	x	25U	25U	1.3 U		1.2 UJ	1.2 U	no		1.3 U		1.3 UJ	1.3 U	1.2 U	no	yes
2,4-Dinitrotoluene	73	0.2	9.1		yes	8270C	µg/L	x	x	10U	10U	0.12 U		0.11 U	0.11 U	no		0.12 U		0.12 U	0.12 U	0.11 U	no	yes
2,6-Dichlorophenol	35	10	0.2		yes	8270C	µg/L		x	10U	10U	0.10 U		0.093 U	0.094 UJ	no		0.10 U		0.096 U	0.099 UJ	0.094 UJ	no	yes
2,6-Dinitrotoluene	37		0.05		yes	8270C	µg/L	x	x	10U	10U	0.13 U		0.12 U	0.12 U	yes		0.13 U		0.13 U	0.13 U	0.11 U	yes	yes
2-Acetylaminofluorene	0.014				yes	8270C	µg/L		x	10U	10U	0.20 U		0.19 UJ	0.19 U	yes		0.20 U		0.19 UJ	0.2 U	0.19 U	yes	yes
2-Chloronaphthalene	550		7.5		yes	8270C	µg/L	x	x	10U	10U	0.10 U		0.093 U	0.094 U	no		0.10 U		0.096 UJ	0.099 U	0.094 U	no	yes
2-Chlorophenol	180		400		yes	8270C	µg/L	x	x	10U	10U	0.12 U		0.110 U	0.11 U	no		0.12 U		0.12 U	0.12 U	0.11 U	no	yes
2-Methylnaphthalene	27		300		yes	8270C	µg/L	x	x	10U	10U	0.10 U		0.093 U	0.094 U	no		0.10 U		0.096 UJ	0.099 U	0.094 U	no	yes
2-Methylphenol	1,800		1,800		yes	8270C	µg/L	x	x	10U	10U	0.74 U		0.69 U	0.7 U	no		0.74 U		0.71 U	0.73 U	0.69 U	no	yes
2-Naphthylamine	0.033	10			yes	8270C	µg/L		x	10U	10U	1.3 UJ		1.2 UJ	1.2 UJ	no		1.3 U		1.3 R	1.3 R	1.2 R	no	yes
2-Nitroaniline	2.2	50	2.2		yes	8270C	µg/L	x	x	25U	25U	0.20 U		0.19 U	0.19 U	no		0.20 U		0.19 U	0.2 UJ	0.19 U	no	yes
2-Nitrophenol	NA		150		yes	8270C	µg/L	x	x	10U	10U	0.10 U		0.093 U	0.094 U	no		0.10 U		0.096 U	0.099 U	0.094 U	no	yes
2-Picoline					yes	8270C	µg/L		x	10U	10U	0.20 U		0.19 U	0.19 U	no		0.20 U		0.19 U	0.2 UJ	0.19 U	no	yes
3 & 4-Methylphenol	1,800		1,800		yes	8270C	µg/L	x	x	10U	10U	0.66 U		0.62 U	0.62 U	no		0.66 U		0.64 U	0.65 U	0.62 U	no	yes
3,3'-Dichlorobenzidine	0.15	50	0.15		yes	8270C	µg/L	x	x	10U	10U	2.0 U		1.9 U	1.9 UJ	no		2.0 UJ		1.9 R	2 R	1.9 R	no	yes
3,3'-Dimethylbenzidine	0.0056	10			yes	8270C	µg/L		x	20U	20U	5.0 UJ		4.7 UJ	4.7 UJ	no		5.0 U		4.8 R	4.9 R	4.7 R	no	yes
3-Methylcholanthrene	0.00098				yes	8270C	µg/L		x	10U	10U	0.50 U		0.47 U	0.47 UJ	yes		0.50 U		0.48 U	0.49 UJ	0.47 UJ	yes	yes
3-Nitroaniline	110		110		yes	8270C	µg/L	x	x	25U	25U	0.20 U		0.19 UJ	0.19 U	no		0.20 U		0.19 UJ	0.2 U	0.19 U	no	yes
2-Methyl-4,6-dinitrophenol/4,6-Dinitro-2-methylphenol	1.2		2.3		yes	8270C	µg/L	x	x	25U	25U	0.13 U		0.12 UJ	0.12 U	no		0.13 U		0.13 UJ	0.13 U	0.12 U	no	yes
4-Aminobiphenyl	0.0026				yes	8270C	µg/L		x	10U	10U	0.31 U		0.29 UJ	0.29 UJ	yes		0.31 R		0.30 R	0.31 R	0.29 R	yes	yes
4-Bromophenyl-phenyl ether	2,100		2,100		yes	8270C	µg/L	x	x	10U	10U	0.12 U		0.11 U	0.11 U	no		0.12 U		0.12 U	0.12 U	0.11 U	no	yes
4-Chloro-3-methylphenol (p-chloro-m-Cresol)	1,100		0.3		yes	8270C	µg/L	x	x	10U	10U	0.12 U		0.11 U	0.11 U	no		0.12 U		0.12 U	0.12 U	0.11 U	no	yes
4-Chloroaniline	150		29,700		yes	8270C	µg/L	x	x	10U	10U	0.36 U		0.34 U	0.34 U	no		0.36 U		0.35 U	0.36 U	0.34 U	no	yes
4-Chlorophenyl phenyl ether/1-chloro-4-phenoxy-Benzene	2				yes	8270C	µg/L	x	x	10U	10U	0.10 U		0.093 U	0.094 U	no		0.10 U		0.096 U	0.099 U	0.094 U	no	yes
4-Nitroaniline	110		110		yes	8270C	µg/L	x	x	25U	25U	0.50 U		0.47 U	0.47 UJ	no		0.50 U		0.48 U	0.49 UJ	0.47 U	no	yes
4-Nitrophenol	2,300		71.7		yes	8270C	µg/L	x	x	25U	25U	0.50 U		0.47 UJ	0.47 U	no		0.50 U		0.48 UJ	0.49 U	0.47 U	no	yes
4-Nitroquinoline-n-oxide (4-Nitroquinoline-1-oxide)					yes	8270C	µg/L		x	20UR	20UR	1.3 U		1.2 UJ	1.2 UJ	no		1.3 U		1.3 UJ	1.3 UJ	1.2 UJ	no	yes
5-Nitro-o-toluidine/n-nitro-o-toluidine					yes	8270C	µg/L		x	20U	20U	0.10 U		0.093 U	0.094 U	no		0.10 U		0.096 U	0.099 U	0.094 U	no	yes
7,12-Dimethylbenz(a)anthracene	0.000086				yes	8270C	µg/L		x	10U	10U	0.20 U		0.19 U	0.19 U	yes		0.20 U		0.19 U	0.2 U	0.19 U	yes	yes
alpha,alpha-Dimethylphenethylamine					yes	8270C	µg/L		x	10U	10U	3.4 UJ		3.2 UJ	3.2 U	no		3.4 U		3.3 UJ	3.4 U	3.2 U	no	yes
Acenaphthene	2,200		2,700	10	yes	8270C	µg/L	x	x	10U	10U	0.10 U		0.093 U	0.094 U	no		0.10 U		0.096 U	0.099 U	0.094 U	no	yes
Acenaphthylene			300	1	yes	8270C	µg/L	x	x	10U	10U	0.10 U		0.093 U	0.094 U	no		0.10 U		0.096 U	0.099 U	0.094 U	no	yes
Acetophenone	1,500				yes	8270C	µg/L		x	10U	10U	**0.21 J**		0.093 U	0.11 U	no		**0.18 J**		0.11 U	0.15 U	0.11 U	no	yes
Aniline	12		2.2	6	yes	8270C	µg/L		x	10U	10U	0.97 U		0.91 U	0.91 U	no		0.97 U		0.93 U	0.96 U	0.91 U	no	yes
Anthracene	1,300		110,000	3	yes	8270C	µg/L	x	x	10U	10U	0.10 U		0.093 U	0.094 U	no		0.10 U		0.096 U	0.099 U	0.094 U	no	yes
Aramite, Total	2.7		20	20	yes	8270C	µg/L		x	20U	20U	0.11 U		0.10 U	0.1 U	no		0.11 U		0.11 U	0.11 U	0.1 U	no	yes
Benzidine	0.000092	400	3.9	400	yes	8270C	µg/L			50U	50U			7.4 UJ	7.4 UJ	no				7.6 UJ	7.8 UJ	7.4 UJ	no	yes
Benzo(a)anthracene	0.092	0.2	6.3	0.2	yes	8270C	µg/L	x	x	10U	10U	0.10 U		0.093 U	0.094 U	no		0.10 U		0.096 U	0.099 U	0.094 U	no	yes
Benzo(a)pyrene	0.2		0.21	0.1	yes	8270C	µg/L	x	x	10U	10U	0.10 U		0.093 U	0.094 U	no		0.10 U		0.096 U	0.099 U	0.094 U	no	yes
Benzo(b)fluoranthene	0.092	0.1	300	0.1	yes	8270C	µg/L	x	x	10U	10U	0.10 U		0.093 U	0.094 U	no		0.10 U		0.096 U	0.099 U	0.094 U	no	yes

Table 7. SWMU-1 Groundwater Semi-Volatile Organic Compounds (SVOCs) (Continued)

SVOCs	Action Level (Ground-Water)	PQL (Ground-water)	Action Level (Surface-Water)	PQL (Surface Water)	Retained for PMP Mod Nov-12	Method	Units	App B	App IX	Location S1MW-07 Date Collected Jan-03	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Jan-14 Retain	Location S1MW-09 Date Collected Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Dec-13Dup	Jan-14 Retain	Retained for PMP Mod Apr-14
Benzo(g,h,i)perylene	NA		300	0.2	yes	8270C	µg/L	x	x	10U	10U	0.10 U		0.093 U	0.094 U	no		0.10 U		0.096 U	0.099 U	0.094 U	no	yes
Benzo(k)fluoranthene	0.92		300	0.1	yes	8270C	µg/L	x	x	10U	10U	0.50 U		0.093 U	0.094 U	no		0.5 U		0.096 U	0.099 U	0.094 U	no	yes
Benzyl alcohol	1,500		8.6		yes	8270C	µg/L		x	20U	20U	**0.15 J**		0.19 U	0.19 U	no		**0.14 J**		0.19 U	0.2 U	0.19 U	no	yes
Bis(2-chloroethoxy)methane	47		6,400		yes	8270C	µg/L	x	x	10U	10U	0.10 U		0.093 U	0.094 U	no		0.10 U		0.096 U	0.099 U	0.094 U	no	yes
Bis(2-chloroethyl)ether	0.0092	10	2,380	10	yes	8270C	µg/L	x	x	10U	10U	0.10 U		0.093 U	0.094 U	no		0.10 U		0.096 U	0.099 U	0.094 U	no	yes
Bis(2-ethylhexyl)phthalate	6	10	0.3	10	yes	8270C	µg/L	x	x	10U	10U	**1.1 J**		0.60 U	0.6 U	no		**1.1 J**		0.62 U	0.63 U	0.6 U	no	yes
Butyl benzyl phthalate	7,300		3		yes	8270C	µg/L	x	x	10U	10U	**0.14 J**		0.11 U	0.11 U	no		0.12 U		0.12 U	**0.17 J**	0.11 UJ	no	yes
Carbazole	3	10	3.4		yes	8270C	µg/L	x	x	10U	10U			0.093 UJ	0.094 UJ	no				0.096 UJ	0.099 UJ	0.099 UJ	no	yes
Chlorobenzilate	0.27	0.8		0.8	yes	8270C	µg/L		x	20U	20U			0.46 U	0.46 U	no				0.49 U	0.5 U	0.46 U	no	yes
Chrysene	9		300	0.2	yes	8270C	µg/L	x	x	10U	10U	0.10 U		0.093 U	0.094 U	no		0.10 U		0.096 U	0.099 U	0.094 U	no	yes
Diallate	0.46				yes	8270C	µg/L		x	20UR	20UR	0.10 U		0.093 U	0.094 U	no		0.10 U		0.096 U	0.099 UJ	0.094 U	no	yes
Dibenzo(a,h)anthracene	0.0092	0.2	300	0.2	yes	8270C	µg/L	x	x	10U	10U	0.10 U		0.093 U	0.094 U	no		0.10 UJ		0.096 U	0.099 U	0.094 U	no	yes
Dibenzofuran	150		150		yes	8270C	µg/L	x	x	10U	10U	0.10 U		0.093 U	0.094 U	no		0.10 U		0.096 UJ	0.099 U	0.094 U	no	yes
Diethyl phthalate	29,000		3.0		yes	8270C	µg/L	x	x	10U	10U	0.11 U		**0.12 J**	**0.11 J**	no		**0.32 J**		**0.13 J**	**0.14 J**	0.1 UJ	no	yes
Dimethoate	3.1		1.1	1.1	yes	8270C	µg/L		x	10U	10U	0.20 U		0.19 U	0.19 U	no		0.2 U		0.19 U	0.2 U	0.19 U	no	yes
Dimethyl phthalate	370,000		3.0		yes	8270C	µg/L	x	x	10U	10U	**0.10 J**		0.093 U	0.094 U	no		**0.22 J**		0.096 U	0.099 U	0.094 U	no	yes
Di-n-butyl phthalate	3,700		3		yes	8270C	µg/L	x	x	10U	10U	0.39 U		0.36 U	0.37 U	no		0.39 U		0.38 U	0.38 U	0.37 U	no	yes
Di-n-octylphthalate	730		3		yes	8270C	µg/L	x	x	10U	10U	0.17 U		0.16 UJ	0.16 U	no		0.17 UJ		0.16 UJ	0.17 U	0.16 U	no	yes
Dinoseb	7.0				yes	8270C	µg/L		x			0.2 U		0.19 UJ	0.19 U	no		0.20 U		0.19 UJ	0.2 UJ	0.19 U	no	yes
Disulfoton	0.38		0.4		yes	8270C	µg/L		x	10U	10U	0.20 U		0.19 UJ	0.19 U	no		0.20 U		0.19 UJ	0.2 U	0.19 U	no	yes
Ethyl methanesulfonate					yes	8270C	µg/L		x	10U	10U	0.10 U		0.093 UJ	0.094 U	no		0.10 U		0.096 UJ	0.099 U	0.094 U	no	yes
Famphur					yes	8270C	µg/L		x	10U	10UJ	0.16 U		0.15 U	0.15 U	no		0.16 U		0.15 U	0.16 U	0.15 U	no	yes
Fluoranthene	1,500		370	1	yes	8270C	µg/L	x	x	10U	10U	0.10 U		0.093 U	0.094 U	no		0.10 U		0.096 U	0.099 U	0.094 U	no	yes
Fluorene	1,500		14,000		yes	8270C	µg/L	x	x	10U	10U	0.10 U		0.093 U	0.094 U	no		0.10 U		0.096 U	0.099 U	0.094 U	no	yes
Hexachlorobenzene	1		3.68	0.1	yes	8270C	µg/L	x	x	10U	10U	0.10 U		0.093 U	0.094 U	no		0.10 U		0.096 U	0.099 U	0.094 U	no	yes
Hexachlorobutadiene	0.14	3	49.7		yes	8270C	µg/L	x	x	10U	10U	0.10 U		0.093 U	0.094 U	no		0.10 U		0.096 U	0.099 U	0.094 U	no	yes
Hexachlorocyclopentadiene	50		0.07		yes	8270C	µg/L	x	x	10U	10U	0.50 U		0.47 U	0.47 U	no		0.50 U		0.48 U	0.49 U	0.47 U	no	yes
Hexachloroethane	0.75	10	9.4	10	yes	8270C	µg/L	x	x	10U	10U	0.50 U		0.47 U	0.47 U	no		0.50 U		0.48 UJ	0.49 U	0.47 U	no	yes
Hexachlorophene	4.7	30	30	30	yes	8270C	µg/L		x	10U	10U	25 U		23 UQ	23 U	no		25 UJ		24 R	25 UJ	23 UJ	no	yes
Hexachloropropene					yes	8270C	µg/L		x	10U	10U	0.10 UJ		0.093 U	0.094 U	no		0.10 U		0.096 U	0.099 UJ	0.094 U	no	yes
Indeno(1,2,3-cd)pyrene	0.092	0.2	300	0.2	yes	8270C	µg/L	x	x	10U	10U	0.10 U		0.049 U	0.094 UJ	no		0.10 U		0.096 U	0.099 UJ	0.094 UJ	no	yes
Isodrin		6			yes	8270C	µg/L		x	20U	20U	0.49 U		0.046 U	0.046 U	no		0.51 U		0.049 U	0.05 U	0.046 U	no	yes
Isophorone	71		129		yes	8270C	µg/L	x	x	10U	10U	0.10 U		0.093 U	0.094 U	no		0.10 U		0.096 U	0.099 U	0.094 U	no	yes
Isosafrole					yes	8270C	µg/L		x	20U	20U	0.10 U		0.093 U	0.094 U	no		0.10 U		0.096 U	0.099 U	0.094 U	no	yes
Kepone (Chlordecone)	0.003	6			yes	8270C	µg/L		x	10UR	10UR	9.7 U		0.93 U	0.93 U	no		10 U		0.97 U	0.99 U	0.93 U	no	yes
Methapyrilene					yes	8270C	µg/L		x	10U	10U	2.5 U		2.3 U	2.3 U	no		2.5 U		2.4 U	2.5 U	2.3 U	no	yes
Methyl Methanesulfonate	0.68				yes	8270C	µg/L		x	20U	20U	0.10 UJ		0.093 UJ	0.094 U	no		0.10 U		0.096 UJ	0.099 UJ	0.094 U	no	yes
Methyl parathion	3.4		0.5		yes	8270C	µg/L		x	10U	10U	0.20 U		0.19 U	0.19 U	no		0.20 U		0.19 U	0.2 U	0.219U	no	yes
Naphthalene	1,500		23.5		yes	8270C	µg/L	x	x	10U	10U	0.10 U		0.093 U	0.094 U	no		0.10 U		0.096 UJ	0.099 U	0.094 U	no	yes
Nitrobenzene	3.4	10	66.8		yes	8270C	µg/L	x	x	10U	10U	0.10 U		0.093 U	0.094 U	no		0.10 U		0.096 U	0.099 U	0.094 U	no	yes
N-Nitrosodiethylamine	10	10	768	10	yes	8270C	µg/L		x	20U	20U	0.10 U		0.093 U	0.094 U	no		0.10 U		0.096 U	0.099 U	0.094 U	no	yes
N-Nitrosodimethylamine	10	10	10	10	yes	8270C	µg/L		x	20U	20U	0.25 U		0.23 U	0.23 U	no		0.25 U		0.24 U	0.25 U	0.23 U	no	yes
N-Nitrosodi-n-butylamine	10	10	10	10	yes	8270C	µg/L		x	10U	10U	0.10 U		0.093 U	0.094 U	no		0.10 U		0.096 U	0.099 U	0.094 U	no	yes
N-Nitroso-di-n-propylamine	10	10	10	10	yes	8270C	µg/L		x	10U	10U	0.13 U		0.12 U	0.12 U	no		0.13 U		0.13 U	0.13 U	0.12 U	no	yes
N-nitrosodiphenylamine/Diphenylamine	14	10	58.5	10	yes	8270C	µg/L	x	x	10U	10U	0.37 U		0.35 U	0.35 U	no		0.37 U		0.36 U	0.37 U	0.35 U	no	yes
N-Nitrosomethylethylamine	10	10	10	10	yes	8270C	µg/L		x	10U	10U	0.20 U		0.19 U	0.19 U	no		0.20 U		0.19 U	0.2 U	0.19 U	no	yes
N-Nitrosomorpholine	0.01				yes	8270C	µg/L		x	10U	10U	0.10 U		0.093 U	0.094 U	yes		0.10 U		0.096 U	0.099 U	0.094 U	yes	yes
N-Nitrosopiperidine	0.0071				yes	8270C	µg/L		x	10U	10U	0.10 U		0.093 U	0.094 U	yes		0.10 U		0.096 U	0.099 U	0.094 U	yes	yes
N-Nitrosopyrrolidine	10	10			yes	8270C	µg/L		x	10U	10U	0.10 U		0.093 U	0.094 U	no		0.10 U		0.096 U	0.099 U	0.094 U	no	yes
O,O',O"-Triethyl phosphorothioate					yes	8270C	µg/L		x	20U	20U	0.13 U		0.12 U	0.12 U	no		0.13 U		0.13 U	0.13 U	0.12 U	no	yes
2-Toluidine/o-Toluidine					yes	8270C	µg/L		x	10U	10U	0.13 U		0.12 U	0.12 U	no		0.13 U		0.13 U	0.13 U	0.12 U	no	yes
p-Dimethylamino azobenzene	0.0043				yes	8270C	µg/L		x	20U	20U	0.20 U		0.19 U	0.19 U	yes		0.20 U		0.19 U	0.2 U	0.19 U	yes	yes
Parathion/Ethyl Parathion	65		0.6	0.6	yes	8270C	µg/L		x			0.2 U		0.19 U	0.19 U	no		0.20 U		0.19 U	0.2 U	0.19 U	no	yes
Pentachlorobenzene	10	10	129	7	yes	8270C	µg/L		x	10U	10U	0.10 U		0.093 U	0.094 U	no		0.10 U		0.096 U	0.099 U	0.094 U	no	yes
Pentachloronitrobenzene	0.3	0.3	0.3	0.3	yes	8270C	µg/L		x	10U	10U	0.50 U		0.47 U	0.47 U	yes		0.50 U		0.48 U	0.49 U	0.47 U	yes	yes
Pentachlorophenol	1		7.9		yes	8270C	µg/L	x	x	25U	25U	0.40 U		0.37 U	0.38 U	no		0.40 U		0.39 U	0.39 U	0.37 U	no	yes
Phenacetin	30				yes	8270C	µg/L		x	10U	10U	0.10 U		0.093 U	0.094 U	no		0.10 U		0.096 U	0.099 U	0.094 U	no	yes
Phenanthrene			4.6	0.2	yes	8270C	µg/L	x	x	10U	10U	0.10 U		0.093 U	0.094 U	no		0.10 U		0.096 U	0.099 U	0.094 U	no	yes
Phenol	22,000		300		yes	8270C	µg/L	x	x	10U	10U	0.13 U		0.12 U	0.12 U	no		0.13 U		0.13 U	0.13 U	0.12 U	no	yes
Phorate	2.3		0.5	0.5	yes	8270C	µg/L		x	10U	10U	0.20 U		0.19 UJ	0.19 U	no		0.20 U		0.19 UJ	0.2 U	0.19 U	no	yes
Pronamide (Propyzamide or Kerb)	900				yes	8270C	µg/L		x	10U	10U	0.12 U		0.11 U	0.11 U	no		0.12 U		0.12 U	0.12 U	0.11 U	no	yes

Table 7. SWMU-1 Groundwater Semi-Volatile Organic Compounds (SVOCs) (Continued)

SVOCs	Action Level (Ground-Water)	PQL (Ground-water)	Action Level (Surface-Water)	PQL (Surface Water)	Retained for PMP Mod Nov-12	Method	Units	App B	App IX	Location S1MW-07 Date Collected Jan-03	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Jan-14 Retain	Location S1MW-09 Date Collected Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Dec-13Dup	Jan-14 Retain	Retained for PMP Mod Apr-14
Pyrene	1,100		11,000	2	yes	8270C	µg/L	x	x	10U	10U	0.13 U	0.20 U	0.12 U	0.12 U	no		**0.82**	0.19 U	0.13 U	0.13 U	0.12 U	no	yes
Pyridine	20	20	25		yes	8270C	µg/L		x	50U	50U	0.73 U		0.68 U	0.69 U	no		0.73 U		0.70 U	0.72 U	0.68 U	no	yes
Safrole, Total	0.062				yes	8270C	µg/L		x	10U	10U	0.10 U		0.093 U	0.094 U	yes		0.10 U		0.096 U	0.099 U	0.094 U	yes	yes
Sulfotepp (Tetraethyl Dithiopyrophosphate)	5.3				yes	8270C	µg/L		x	10U	10U	0.14 U		0.13 UJ	0.13 U	no		0.14 U		0.13 UJ	0.14 U	0.13 U	no	yes
Thionazin					yes	8270C	µg/L		x			0.2 U		0.19 U	0.19 U	no		0.20 U		0.19 U	0.2 U	0.19 U	no	yes

Not an Appendix B or Appendix IX Compound
Not an Appendix B Compound
U.S. EPA Regional Screening Level (2012) Tap Water value
U.S. EPA Regional Screening Level (2012)Maximum Contaminant Level value
PQL listed in 62-777 FAC PQL Tables
NOAA SQuiRTs
Detected below Action level
Reporting limit above Action level
Reporting limit above Action level but below PQL
Compound retained during optimization analysis
No Available Data

Action Level and Appendix B (App B) Compounds (B&RE, 1998)
Appendix IX (App IX) Compounds from 40CFR Part 264 Appendix IX

Qualifiers:
J – Estimated Concentration.
U – Non-Detect, Reporting Limit Estimated.
UJ – Non-Detect, Analyte Rejected.
R – Analytical Results is Rejected.

Table 8. SWMU-1 Groundwater Pesticides

Pesticides	Action Level (Ground-water)	PQL (Ground-water)	Action Level (Surface Water)	PQL (Surface Water)	Retained for PMP Mod Nov-12	Method	Units	App B	App IX	Location S1MW-07 Date Collected Jan-03	Jan-03 Dup	Oct-10	Dec-11	Dec-12	Dec-13	Jan-14 Retain	Location S1MW-09 Date Collected Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Dec-13 DUP	Jan-14 Retain	Retained for PMP Modification Jan-14
4,4'-DDD	0.28		0.0064	0.08	yes	8081A	µg/L	x	x	0.10U	0.10U	0.097 U		0.0093 R	0.0093 UJ	no		0.10 U		0.0097 R	0.0099 UJ	0.0093 UJ	no	yes
4,4'-DDE	0.2		0.14	0.08	yes	8081A	µg/L	x	x	0.10U	0.10U	0.097 U		0.0093 R	0.0093 UJ	no		0.10 U		0.0097 R	0.0099 UJ	0.0093 UJ	no	yes
4,4'-DDT	0.2		0.0006	0.2	yes	8081A	µg/L	x	x	0.10U	0.10U	0.097 U		0.0093 R	0.0093 UJ	no		0.10 U		0.0097 R	0.0099 UJ	0.0093 UJ	no	yes
Aldrin	0.004	0.05	0.0001	0.05	yes	8081A	µg/L	x	x	0.050U	0.050U	0.068 U		0.0065 R	0.0065 UJ	no		0.071 U		0.0068 R	0.0069 UJ	0.0065 UJ	no	yes
alpha-BHC	0.011	0.05	0.34	0.05	yes	8081A	µg/L	x	x	0.050U	0.050U	0.055 U		0.0053 R	0.0053 UJ	no		0.058 U		0.0055 R	0.0057 UJ	0.0053 UJ	no	yes
beta-BHC	0.037	0.05	0.046	0.05	yes	8081A	µg/L	x	x	0.050U	0.050U	0.065 U		0.0062 R	0.0062 UJ	no		0.068 U		0.0065 R	0.0066 UJ	0.0062 UJ	no	yes
Chlordane (technical)	0.052		0.052	0.8	yes	8081A	µg/L	x	x	0.50U	0.50U	1.3 U		0.12 R	0.12 UJ	no		1.3 U		0.13 R	0.13 UJ	0.12 UJ	no	yes
delta-BHC			0.34		yes	8081A	µg/L	x	x	0.050U	0.050U	0.049 U		0.0046 R	0.0046 UJ	no		0.051 U		0.0049 R	0.005 UJ	0.0046 UJ	no	yes
Dieldrin	0.0042	0.1	0.0001	0.1	yes	8081A	µg/L	x	x	0.10U	0.10U	0.097 U		0.0093 R	0.0093 UJ	no		0.10 U		0.0097 R	0.0099 UJ	0.0093 UJ	no	yes
Endosulfan I	220		0.0087	0.1	yes	8081A	µg/L	x	x	0.050U	0.050U	0.049 U		0.0046 R	0.0046 UJ	no		0.051 U		0.0049 R	0.005 UJ	0.0046 UJ	no	yes
Endosulfan II	220		0.0087	0.1	yes	8081A	µg/L	x	x	0.10U	0.10U	0.097 U		0.0093 R	0.0093 UJ	no		0.10 U		0.0097 R	0.0099 UJ	0.0093 UJ	no	yes
Endosulfan sulfate			0.1	0.1	yes	8081A	µg/L	x	x	0.10U	0.10U	0.097 U		0.0093 R	0.0093 UJ	no		0.10 U		0.0097 R	0.0099 UJ	0.0093 UJ	no	yes
Endrin	2		0.0023	0.2	yes	8081A	µg/L	x	x	0.10U	0.10U	0.097 U		0.0093 R	0.0093 UJ	no		0.10 U		0.0097 R	0.0099 UJ	0.0093 UJ	no	yes
Endrin aldehyde					yes	8081A	µg/L	x	x	0.10U	0.10U	0.16 U		0.015 R	0.015 UJ	no		0.16 U		0.016 R	0.016 UJ	0.015 UJ	no	yes
Endrin ketone					yes	8081A	µg/L	x		0.10U	0.10U	0.097 U		0.0093 R	0.0093 UJ	no		0.10 U		0.0097 R	0.0099 UJ	0.0093 UJ	no	yes
gamma-BHC (Lindane)	0.2		0.063	0.1	yes	8081A	µg/L	x	x	0.050U	0.050U	0.057 U		0.0055 R	0.0055 UJ	no		0.060 U		0.0057 R	0.0059 UJ	0.0055 UJ	no	yes
Heptachlor	0.4		0.0002	0.05	yes	8081A	µg/L	x	x	0.050U	0.050U	0.068 U		0.0065 R	0.0065 UJ	no		0.071 U		0.0068 R	0.0069 UJ	0.0065 UJ	no	yes
Heptachlor epoxide	0.2		0.0036	0.08	yes	8081A	µg/L	x	x	0.050U	0.050U	0.058 U		0.0056 R	0.0056 UJ	no		0.061 U		0.0058 R	0.006 UJ	0.0056 UJ	no	yes
Methoxychlor	40		0.03	0.2	yes	8081A	µg/L	x	x	0.50U	0.50U	0.13 U		0.012 R	0.012 UJ	no		0.13 U		0.013 R	0.013 UJ	0.012 UJ	no	yes
Toxaphene	3		0.0002	3	yes	8081A	µg/L	x	x	1.0U	1.0U	4.9 U		0.46 R	0.46 UJ	no		5.1 U		0.49 R	0.5 UJ	0.46 UJ	no	yes

Not an Appendix IX Compound
PQL listed in 62-777 FAC PQL Table E (Marine Surface Water)
Reporting limit above Action level
Reporting limit above Action level but below PQL
Compound retained during optimization analysis
No Available Data

Action Level and Appendix B (App B) Compounds (B&RE, 1998)
Appendix IX (App IX) Compounds from 40CFR Part 264 Appendix IX

Qualifiers:

U – Non-Detect, Reporting Limit Estimated.
UJ – Non-Detect, Analyte Rejected.
R – Analytical Results is Rejected.

Table 9. SWMU-1 Surface Water Metals

Inorganics	Action Level (Surface Water)	PQL (Surface Water)	Retained for PMP Mod Nov-12	Method	Units	App B	TAL	Location						Location							Location						
								S1SW-01						S1SW-02							S1SW-03						
								Date Collected					Jan-14	Date Collected						Jan-14	Date Collected						Jan-14
								Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Dec-13 DUP	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain
Aluminum	1,500		yes	6010B	µg/L	x	x	132 U	**420**		**180**	**320 J**	no	96.3 U	100U		50 U	250 U	250 U	no	281 U	**360**		**85 J**	250 U	no
Antimony	4,300		yes	6010B	µg/L	x	x	**13.9**	10U		**2.7 J**	2.0 U	no	3.6 U	10U		2.0 U	2 U	2 U	no	**5.4**	10U		2.0 U	2 U	no
Arsenic	50		yes	6010B	µg/L	x	x	7.8 U	8.0U		**2.8**	6.5 U	no	4.7 U	**5.2J**		**2.6**	6.5 U	6.5 U	no	4.7 U	8.0U		**2.5**	6.5 U	no
Barium	10,000		yes	6010B	µg/L	x	x	**123**	**14**		**36**	**26**	no	**17.3**	**13**		**26**	**20**	**20**	no	**52.6**	**14**		**20**	**16**	no
Beryllium	0.28		yes	6010B	µg/L	x	x	0.96 U	0.20U	5.0U	0.25 U	**1.6**	yes	1.6 U	0.20U	5.0U	0.25 U	0.25 U	0.25 U	no	0.96 U	0.20U	5.0U	0.25 U	0.25 U	no
Cadmium	9.3		yes	6010B	µg/L	x	x	7.8 U	2.0U	5.0U	**0.27 J**	**0.42 J**	no	13.0 U	2.0U	5.0U	**0.14 J**	**0.21 J**	**0.16 J**	no	**17.6**	2.0U	5.0U	**0.22 J**	**0.17 J**	no
Calcium			yes	6010B	µg/L	x	x	**1,250,000**	**440,000J**		**450,000**	**500000 J**	no	**559,000**	**420,000**		**430,000**	**540,000 J**	**530,000 J**	no	**606,000**	**420,000**		**410,000**	**490000 J**	no
Chromium	50		yes	6010B	µg/L	x	x	**41.4**	2.0U		2.5 U	13 U	no	1.3 U	2.0U		2.5 U	13 U	13 U	no	**62.4**	2.0U		2.5 U	13 U	no
Cobalt	35,000		yes	6010B	µg/L	x	x	2.8 U	2.0U		**1.3**	**2 J**	no	1.7 U	2.0U		**0.95**	**1.8 J**	**1.7 J**	no	1.7 U	2.0U		**0.88**	**1.6 J**	no
Copper	2.9		yes	6010B	µg/L	x	x	**16.6**	**3.3J**	**18JD**	7.5 U	**12 J**	yes	11.9 U	2.0U	50U	1.7 U	5.5 U	5.5 U	yes	**28.9**	**5.0J**	50U	2.4 U	5.5 U	yes
Iron	300		yes	6010B	µg/L	x	x	31.2 U	**420**		**1,500**	**2600**	yes	183 U	**180**		**270**	**420 J**	**400 J**	yes	**412**	**500**		**220**	220 U	no
Lead	5.6		yes	6010B	µg/L	x	x	4.4 U	4.0U	**12JD**	**8.2**	**13**	yes	2.6 U	4.0U	15U	**1.1 J**	**1.4 J**	**1.4 J**	no	**320**	4.0U	15U	**2.1**	**0.82 J**	no
Magnesium			yes	6010B	µg/L	x	x	**1,540,000**	**1,400,000DJ**		**1,400,000**	**1,400,000**	no	**1,670,000**	**1,300,000D**		**2,200,000**	**1,700,000**	**1,700,000**	no	**1,380,000**	**1,300,000D**		**1,500,000**	**1,600,000**	no
Manganese	10		yes	6010B	µg/L	x	x	5.8 U	2.0U	**45JD**	**130**	**170**	yes	2.9 U	2.0U	50U	**32**	**24 J**	**24 J**	yes	**127**	**5.1J**	50U	**26**	**17 J**	yes
Mercury	1.26		yes	7470A	µg/L	x	x	**0.83**	0.10U	8.0U	0.10 UJ	**0.13 J**	no	0.08 U	0.10U	8.0U	0.10 UJ	0.1 U	0.1 U	no	0.40 U	0.10U	8.0U	0.10 UJ	0.1 U	no
Nickel	8.3		yes	6010B	µg/L	x	x	30.5 U	4.0U		**4.1 J**	10 U	yes	50.9 U	4.0U		2.0 U	10 U	10 U	yes	30.5 U	4.0U		2.0 U	10 U	yes
Potassium			yes	6010B	µg/L	x	x	**679,000**	**450,000DJ**		**490,000**	**360000 J**	no	**526,000**	**420,000D**		**540,000**	**480000 J**	**480000 J**	no	**453,000**	**450,000D**		**490,000**	**450000 J**	no
Selenium	71		yes	6010B	µg/L	x	x	10.6 U	8.0U		**1.3 J**	5.5 U	no	6.4 U	8.0U		**1.2 J**	5.5 U	5.5 U	no	6.4 U	8.0U		**1.1 J**	5.5 U	no
Silver	2.3		yes	6010B	µg/L	x	x	7.4 U	1.6U		**0.29 J**	**0.67 J**	no	12.3 U	1.6U		0.25 U	0.25 U	0.25 U	no	7.4 U	**1.0J**		0.25 U	0.25 U	no
Sodium			yes	6010B	µg/L	x	x	**15,200,000**	**13,000,000DJ**		**12,000,000**	**10000000**	no	**13,400,000**	**12,000,000D**		**19,000,000**	**13,000,000**	**13,000,000**	no	**10,300,000**	**13,000,000D**		**13,000,000**	**12,000,000**	no
Thallium	7.3		yes	6020	µg/L	x	x	14.3 U	0.25 U		0.25 U	0.25 U	no	8.6 U	0.25U		0.25 U	0.25 U	0.25 U	no	8.6 U	0.25U		0.25 U	0.25 U	no
Tin	0.01		yes	6010B	µg/L	x		10.0 U			**1.4 J**	1.4 U	yes	6.0 U			1.4 U	1.4 U	1.4 U	yes	6.0 U			**1.4 J**	1.4 U	yes
Vanadium	10,000		yes	6010B	µg/L	x	x	**28.4**	2.4U		3.2 U	16 U	no	25.9 U	2.4U		3.2 U	16 U	16 U	no	15.5 U	2.4U		3.2 U	16 U	no
Zinc	86		yes	6010B	µg/L	x	x	7.1 U	**9.5J**		**43 J**	**82 J**	no	**51.2**	10U		**18 J**	42 U	42 U	no	**120**	**22**		**16 J**	42 U	no

Inorganics	Action Level (Surface Water)	PQL (Surface Water)	Retained for PMP Mod Nov-12	Method	Units	App B	TAL	Location						Location						Retained for PMP Modification Apr-14
								S1SW-04						S1SW-05						
								Date Collected					Jan-14	Date Collected					Jan-14	
								Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	
Aluminum	1,500		yes	6010B	µg/L	x	x		100U		50 U	250 U	no		100U		50 U	250 U	no	yes
Antimony	4,300		yes	6010B	µg/L	x	x		10U		2.0 U	2 U	no		10U		2.0 U	2 U	no	yes
Arsenic	50		yes	6010B	µg/L	x	x		8.0U		**2.4 J**	6.5 U	no		**6.1J**		**2.6**	6.5 U	no	yes
Barium	10,000		yes	6010B	µg/L	x	x		**20**		**19**	15 U	no		**9.3J**		**20**	**17**	no	yes
Beryllium	0.28		yes	6010B	µg/L	x	x		0.20U	5.0U	0.25 U	0.25 U	no		0.20U	5.0U	0.25 U	0.25 U	no	yes
Cadmium	9.3		yes	6010B	µg/L	x	x		2.0U	5.0U	**0.17 J**	**0.19 J**	no		2.0U	5.0U	0.20 U	0.2 U	no	yes
Calcium			yes	6010B	µg/L	x	x		**470,000**		**410,000**	**500000 J**	no		**420,000**		**420,000**	**540000 J**	no	yes
Chromium	50		yes	6010B	µg/L	x	x		2.0U		2.5 U	13 U	no		2.0U		2.5 U	13 U	no	yes
Cobalt	35,000		yes	6010B	µg/L	x	x		2.0U		**0.86**	**1.6 J**	no		2.0U		**0.84**	**1.8 J**	no	yes
Copper	2.9		yes	6010B	µg/L	x	x		**12J**	50U	1.4 U	5.5 U	yes		**1.9J**	50U	1.1 U	5.5 U	yes	yes
Iron	300		yes	6010B	µg/L	x	x		**810**		**150**	220 U	no		**190**		**290**	**360 J**	no	yes
Lead	5.6		yes	6010B	µg/L	x	x		4.0U	15U	**0.94 J**	**0.7 J**	no		4.0U	15U	**1.3 J**	**1.2 J**	no	yes
Magnesium			yes	6010B	µg/L	x	x		**1,400,000D**		**1,500,000**	**1,600,000**	no		**1,300,000D**		**1,400,000**	**1,600,000**	no	yes
Manganese	10		yes	6010B	µg/L	x	x		**52**	50U	**22**	**20 J**	yes		2.0U	50U	**51**	**16 J**	yes	yes
Mercury	1.26		yes	7470A	µg/L	x	x		0.10U	8.0U	0.10 UJ	0.1 U	no		0.10U	8.0U	0.10 UJ	0.1 U	no	yes
Nickel	8.3		yes	6010B	µg/L	x	x		**5.0J**		2.0 U	10 U	yes		4.0U		2.0 U	10 U	yes	yes
Potassium			yes	6010B	µg/L	x	x		**470,000D**		**500,000**	**460000 J**	no		**440,000D**		**500,000**	**460000 J**	no	yes
Selenium	71		yes	6010B	µg/L	x	x		**8.0J**		1.1 U	5.5 U	no		8.0U		**1.2 J**	5.5 U	no	yes
Silver	2.3		yes	6010B	µg/L	x	x		**1.4J**		0.25 U	0.25 U	no		1.6U		0.25 U	0.25 U	no	yes
Sodium			yes	6010B	µg/L	x	x		**13,000,000D**		**13,000,000**	**12,000,000**	no		**12,000,000D**		**12,000,000**	**13,000,000**	no	yes
Thallium	7.3		yes	6020	µg/L	x	x		0.25U		0.25 U	0.25 U	no		0.25U		0.25 U	0.25 U	no	yes
Tin	0.01		yes	6010B	µg/L	x					1.4 U	1.4 U	yes				1.4 U	1.4 U	yes	yes
Vanadium	10,000		yes	6010B	µg/L	x	x		2.4U		3.2 U	16 U	no		2.4U		3.2 U	16 U	no	yes
Zinc	86		yes	6010B	µg/L	x	x		**39**		**15 J**	**75 J**	no		**14J**		**14 J**	42 U	no	yes

Not a Target Analyte List (TAL) Metal
Detected below Action level
Reporting limit above Action level
Detected above Action level
Compound retained during optimization analysis
No Available Data

Action Level and Appendix B (App B) Compounds (B&RE, 1998)
Target Analyte List (TAL) Compounds (B&RE, 1998)

Qualifiers:
D – Dilution Result.
J – Estimated Concentration.
U – Non-Detect, Reporting Limit Estimated.
UJ – Non-Detect Analyte Rejected.
UR – Non-Detect Reporting Limit Listed.

Table 10. SWU-1 Surface Water Semi-Volatile Organic Compounds (SVOCs)

SVOCs	Action Level (Surface Water)	PQL (Surface Water)	Retained for PMP Mod Nov-12	Method	Units	App B	App IX	Location S1SW-01 Date Collected Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Jan-14 Retain	Location S1SW-02 Date Collected Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Dec-13 DUP	Jan-14 Retain	Retained for PMP Modification Apr-14
1,1'-Biphenyl	14		yes	8270C	µg/L				0.10 U		0.093 U	0.99 UJ	no		0.10 U		0.093 U	0.093 U	0.093 U	no	yes
1,2,4,5-Tetrachlorobenzene	10	10	yes	8270C	µg/L		x	10 U	0.10 U		0.093 U	0.99 UJ	no	10 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
1,2,4-Trichlorobenzene	4.5		yes	8270C	µg/L	x	x	10 U	0.10 U		0.093 U	0.99 UJ	no	10 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
1,2-Dichlorobenzene	15.8		yes	8270C	µg/L	x	x	10 U	0.10 U		0.093 U	0.99 UJ	no	10 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
1,2-Diphenylhydrazine (as Azobenzene)	27		yes	8270C	µg/L			20 U			0.093 U	0.99 UJ	no	20 U			0.093 U	0.093 U	0.093 U	no	yes
1,3,5-Trinitrobenzene/sym-Trinitrobenzene			yes	8270C	µg/L		x	10 U	0.50 U		0.46 U	5 UJ	no	10 U	0.51 U		0.46 U	0.47 U	0.47 U	no	yes
1,3-Dichlorobenzene	28.5		yes	8270C	µg/L	x	x	10 U	0.10 U		0.093 U	0.99 UJ	no	10 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
1,3-Dinitrobenzene/m-dinitrobenzene			yes	8270C	µg/L		x	10 U	0.10 U		0.093 U	0.99 UJ	no	10 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
1,4-Dichlorobenzene	11.2		yes	8270C	µg/L	x	x	10 U	**0.47 J**		0.093 U	0.99 UJ	no	10 U	**0.35 J**		0.093 U	0.093 U	0.093 U	no	yes
1,4-Naphthoquinone			yes	8270C	µg/L		x	10 U	0.50 U		0.46 UJ	5 UJ	no	10 U	0.51 U		0.46 UJ	0.47 UJ	0.47 UJ	no	yes
1,4-Phenylenediamine /p-phenylene diamine			yes	8270C	µg/L		x	10 U	16 U		15 UQ	160 UJ	no	10 U	16 U		15 R	15 U	15 U	no	yes
1-Naphthylamine			yes	8270C	µg/L		x	10 U			1.2 U	13 UJ	no	10 U			1.2 U	1.2 U	1.2 U	no	yes
2,2'-oxybis[1-chloropropane]/Bis(2-chloroisopropyl)ether	10		yes	8270C	µg/L		x	10 U	0.10 U		0.093 U	0.99 UJ	no	10 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
2,3,4,6-Tetrachlorophenol	44	50	yes	8270C	µg/L		x	10 U	0.10 U		0.093 U	0.99 UJ	no	10 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
2,4,5-Trichlorophenol	11		yes	8270C	µg/L	x	x	25 U	0.12 U		0.11 U	1.2 UJ	no	25 U	0.12 U		0.11 U	0.11 U	0.11 U	no	yes
2,4,6-Trichlorophenol	6.5	10	yes	8270C	µg/L	x	x	10 U	0.17 U		0.16 U	1.7 UJ	no	10 U	0.17 U		0.16 U	0.16 U	0.16 U	no	yes
2,4-Dichlorophenol	790		yes	8270C	µg/L	x	x	10 U	0.10 U		0.093 U	0.99 UJ	no	10 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
2,4-Dimethylphenol	21.2		yes	8270C	µg/L	x	x	10 U	0.69 U		0.64 U	6.9 UJ	no	10 U	0.70 U		0.64 U	0.64 U	0.64 U	no	yes
2,4-Dinitrophenol	15		yes	8270C	µg/L	x	x	25 U	1.3 U		1.2 UJ	13 UJ	no	25 U	1.3 U		1.2 UJ	1.2 U	1.2 U	no	yes
2,4-Dinitrotoluene	9.1		yes	8270C	µg/L	x	x	10 U	0.12 U		0.11 U	1.2 UJ	no	10 U	0.12 U		0.11 U	0.11 U	0.11 U	no	yes
2,6-Dichlorophenol	0.2		yes	8270C	µg/L		x	10 U	0.10 U		0.093 U	0.99 UJ	yes	10 U	0.10 U		0.093 U	0.093 UJ	0.093 UJ	yes	yes
2,6-Dinitrotoluene	0.05		yes	8270C	µg/L	x	x	10 U	0.13 U		0.12 U	1.3 UJ	yes	10 U	0.13 U		0.12 U	0.12 U	0.12 U	yes	yes
2-Acetylaminofluorene			yes	8270C	µg/L		x	10 U	0.20 U		0.19 UJ	2 UJ	no	10 U	0.20 U		0.19 UJ	0.19 U	0.19 U	no	yes
2-Chloronaphthalene	7.5		yes	8270C	µg/L	x	x	10 U	0.10 U		0.093 U	0.99 UJ	no	10 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
2-Chlorophenol	400		yes	8270C	µg/L	x	x	10 U	0.12 U		0.11 U	1.2 UJ	no	10 U	0.12 U		0.11 U	0.11 U	0.11 U	no	yes
2-Methylnaphthalene	300		yes	8270C	µg/L	x	x	10 U	0.10 U		0.093 U	0.99 UJ	no	10 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
2-Methylphenol	1,800		yes	8270C	µg/L	x	x	10 U	0.74 U		0.69 U	7.4 UJ	no	10 U	0.76 U		0.69 U	0.69 U	0.69 U	no	yes
2-Naphthylamine			yes	8270C	µg/L		x	10 U	1.3 U		1.2 UJ	13 UJ	no	10 U	1.3 U		1.2 UJ	1.2 UJ	1.2 UJ	no	yes
2-Nitroaniline	2.2		yes	8270C	µg/L	x	x	25 U	0.20 U		0.19 U	2 UJ	no	25 U	0.20 U		0.19 U	0.19 U	0.19 U	no	yes
2-Nitrophenol	150		yes	8270C	µg/L	x	x	10 U	0.10 U		0.093 U	0.99 UJ	no	10 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
2-Picoline			yes	8270C	µg/L		x	10 U	0.20 U		0.19 U	2 UJ	no	10 U	0.20 U		0.19 U	0.19 U	0.19 U	no	yes
3 & 4-Methylphenol	1,800		yes	8270C	µg/L	x	x	10 U	0.66 U		0.61 U	6.6 UJ	no	10 U	0.67 U		0.61 U	0.61 U	0.62 U	no	yes
3,3'-Dichlorobenzidine	0.15		yes	8270C	µg/L	x	x	10 U	2.0 U		1.9 U	20 UJ	yes	10 U	2.0 U		1.9 U	1.9 UJ	1.9 UJ	yes	yes
3,3'-Dimethylbenzidine			yes	8270C	µg/L		x	20 U	5.0 U		4.6 UJ	50 UJ	no	20 U	5.1 U		4.6 UJ	4.7 UJ	4.7 UJ	no	yes
3-Methylcholanthrene			yes	8270C	µg/L		x	10 U	0.50 U		0.46 U	5 UJ	no	10 U	0.51 U		0.46 U	0.47 UJ	0.47 UJ	no	yes
3-Nitroaniline	110		yes	8270C	µg/L	x	x	25 U	0.20 U		0.19 UJ	2 UJ	no	25 U	0.20 U		0.19 UJ	0.19 U	0.19 U	no	yes
2-Methyl-4,6-dinitrophenol/4,6-Dinitro-2-methylphenol	2.3		yes	8270C	µg/L	x	x	25 U	0.13 U		0.12 UJ	1.3 UJ	no	25 U	0.13 U		0.12 UJ	0.12 U	0.12 U	no	yes
4-Aminobiphenyl			yes	8270C	µg/L		x	10 U	0.31 U		0.29 UJ	3.1 UJ	no	10 U	0.32 U		0.29 UJ	0.29 R	0.29 R	no	yes
4-Bromophenyl phenyl ether	2,100		yes	8270C	µg/L	x	x	10 U	0.12 U		0.11 U	1.2 UJ	no	10 U	0.12 U		0.11 U	0.11 U	0.11 U	no	yes
4-Chloro-3-methylphenol (p-chloro-m-Cresol)	0.3		yes	8270C	µg/L	x	x	10 U	0.12 U		0.11 U	1.2 UJ	yes	10 U	0.12 U		0.11 U	0.11 U	0.11 U	no	yes
4-Chloroaniline	29,700		yes	8270C	µg/L	x	x	10 U	0.36 U		0.33 U	3.6 UJ	no	10 U	0.37 U		0.33 U	0.34 U	0.34 U	no	yes
4-Chlorophenyl phenyl ether/1-chloro-4-phenoxy-Benzene			yes	8270C	µg/L	x	x	10 U	0.10 U		0.093 U	0.99 UJ	no	10 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
4-Nitroaniline	110		yes	8270C	µg/L	x	x	25 U	0.50 U		0.46 U	5 UJ	no	25 U	0.51 U		0.46 U	0.47 UJ	0.47 UJ	no	yes
4-Nitrophenol	71.7		yes	8270C	µg/L	x	x	25 U	0.50 U		0.46 UJ	5 UJ	no	25 U	0.51 U		0.46 UJ	0.47 U	0.47 U	no	yes
4-Nitroquinoline-1-oxide			yes	8270C	µg/L		x	20 UR	1.3 U		1.2 UJ	13 UJ	no	20 UR	1.3 U		1.2 UJ	1.2 UJ	1.2 UJ	no	yes
5-Nitro-o-toluidine/n-nitro-o-toluidine			yes	8270C	µg/L		x	20 U	0.10 U		0.093 U	0.99 UJ	no	20 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
7,12-Dimethylbenz(a)anthracene			yes	8270C	µg/L		x	10 U	0.20 U		0.19 U	2 UJ	no	10 U	0.20 U		0.19 U	0.19 U	0.19 U	no	yes
a,a-Dimethyl phenethylamine/alpha,alpha-Dimethyl phenethylamine			yes	8270C	µg/L		x	10 U	3.4 U		3.2 UJ	34 UJ	no	10 U	3.5 U		3.2 UJ	3.2 U	3.2 U	no	yes
Acenaphthene	2,700	10	yes	8270C	µg/L	x	x	10 U	0.10 U		0.093 U	0.99 UJ	no	10 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
Acenaphthylene	300	1	yes	8270C	µg/L	x	x	10 U	**0.15 J**		0.093 U	0.99 UJ	no	10 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
Acetophenone			yes	8270C	µg/L		x	10 U	**0.21 J**		0.093 U	0.99 UJ	no	10 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
Aniline	2.2	6	yes	8270C	µg/L		x	10 U	0.97 U		0.90 U	9.6 UJ	yes	10 U	0.99 U		0.90 U	0.9 U	0.91 U	no	yes
Anthracene	110,000	3	yes	8270C	µg/L	x	x	10 U	0.10 U		0.093 U	0.99 UJ	no	10 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
Aramite, Total	20	20	yes	8270C	µg/L		x	20 U	0.11 U		0.10 U	1.1 UJ	no	20 U	0.11 U		0.10 U	0.1 U	0.1 U	no	yes
Benzidine	3.9	400	yes	8270C	µg/L			50 U			7.3 UJ	79 UJ	no	50 U			7.3 UJ	7.4 UJ	7.4 UJ	no	yes
Benzo(a)anthracene	6.3	0.2	yes	8270C	µg/L	x	x	10 U	**0.18 J**		0.093 U	0.99 UJ	no	10 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
Benzo(a)pyrene	0.21	0.1	yes	8270C	µg/L	x	x	10 U	**0.24**		0.093 U	0.99 UJ	yes	10 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
Benzo(b)fluoranthene	300	0.1	yes	8270C	µg/L	x	x	10 U	**0.19 JM**		0.093 U	0.99 UJ	no	10 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
Benzo(g,h,i)perylene	300	0.2	yes	8270C	µg/L	x	x	10 U	**0.26**		0.093 U	0.99 UJ	no	10 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
Benzo(k)fluoranthene	300	0.1	yes	8270C	µg/L	x	x	10 U	**0.23 M**		0.093 U	0.99 UJ	no	10 U	0.51 U		0.093 U	0.093 U	0.093 U	no	yes

Table 10. SWU-1 Surface Water Semi-Volatile Organic Compounds (SVOCs) (Continued)

SVOCs	Action Level (Surface Water)	PQL (Surface Water)	Retained for PMP Mod Nov-12	Method	Units	App B	App IX	Location						Location							Retained for PMP Modification Apr-14
								S1SW-01						S1SW-02							
								Date Collected					Jan-14	Date Collected						Jan-14	
								Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Dec-13 DUP	Retain	
Benzyl alcohol	8.6		yes	8270C	µg/L		x	20 U	0.20 U		0.14 U	2 UJ	no	20 U	0.20 U		0.14 U	0.19 U	0.19 U	no	yes
Bis(2-chloroethoxy)methane	6,400		yes	8270C	µg/L	x	x	10 U	0.10 U		0.093 U	0.99 UJ	no	10 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
Bis(2-chloroethyl)ether	2,380	10	yes	8270C	µg/L	x	x	10 U	0.10 U		0.093 U	0.99 UJ	no	10 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
Bis(2-ethylhexyl)phthalate	0.3	10	yes	8270C	µg/L	x	x	10 U	**0.92 J**		**0.85 J**	6.4 UJ	yes	10 U	0.65 U		0.59 U	0.6 U	0.6 U	no	yes
Butyl benzyl phthalate	3		yes	8270C	µg/L	x	x	10 U	**0.17 J**		0.11 U	1.2 UJ	no	10 U	0.12 U		0.11 U	0.11 U	0.11 U	no	yes
Carbazole	3.4		yes	8270C	µg/L			10 U			0.093 UJ	0.99 UJ	no	10 U			0.093 UJ	0.093 UJ	0.093 UJ	no	yes
Chlorobenzilate		0.8	yes	8270C	µg/L		x	20 U			0.46 U	0.44 UJ	no	20 U			0.46 U	0.46 U	0.46 U	no	yes
Chrysene	300	0.2	yes	8270C	µg/L	x	x	10 U	**0.38**		0.093 U	0.99 UJ	no	10 U	**0.11 J**		0.093 U	0.093 U	0.093 U	no	yes
Diallate			yes	8270C	µg/L		x	20 UR	0.10 U		0.093 U	0.99 UJ	no	20 UR	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
Dibenzo(a,h)anthracene	300	0.2	yes	8270C	µg/L	x	x	10 U	0.10 U		0.093 U	0.99 UJ	no	10 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
Dibenzofuran	150		yes	8270C	µg/L	x	x	10 U	0.10 U		0.093 U	0.99 UJ	no	10 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
Diethyl phthalate	3.0		yes	8270C	µg/L	x	x	10 U	**0.14 J**		0.10 U	1.1 UJ	no	10 U	0.11 U		0.10 U	0.1 U	0.1 U	no	yes
Dimethoate	1.1	1.1	yes	8270C	µg/L		x	10 U	0.20 U		0.19 U	2 UJ	yes	10 U	0.20 U		0.19 U	0.19 U	0.19 U	no	yes
Dimethyl phthalate	3.0		yes	8270C	µg/L	x	x	10 U	0.10 U		0.093 U	0.99 UJ	no	10 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
Di-n-butylphthalate	3		yes	8270C	µg/L	x	x	10 U	0.39 U		0.36 U	3.9 UJ	yes	10 U	0.40 U		0.36 U	0.36 U	0.36 U	no	yes
Di-n-octylphthalate	3		yes	8270C	µg/L	x	x	10 U	0.17 U		0.16 UJ	1.7 UJ	no	10 U	0.17 U		0.16 UJ	0.16 U	0.16 U	no	yes
Dinoseb			yes	8270C	µg/L		x		0.20 U		0.19 UJ	2 UJ	no		0.20 U		0.19 UJ	0.19 U	0.19 U	no	yes
Disulfoton	0.4		yes	8270C	µg/L		x	10 U	0.20 U		0.19 UJ	2 UJ	yes	10 U	0.20 U		0.19 UJ	0.19 U	0.19 U	no	yes
Ethyl methanesulfonate			yes	8270C	µg/L		x	10 U	0.10 U		0.093 UJ	0.99 UJ	no	10 U	0.10 U		0.093 UJ	0.093 U	0.093 U	no	yes
Famphur			yes	8270C	µg/L		x	10 U	0.16 U		0.15 U	1.6 UJ	no	10 U	0.16 U		0.15 U	0.15 U	0.15 U	no	yes
Fluoranthene	370	1	yes	8270C	µg/L	x	x	10 U	**0.30**		0.093 U	0.99 UJ	no	10 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
Fluorene	14,000		yes	8270C	µg/L	x	x	10 U	0.10 U		0.093 U	0.99 UJ	no	10 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
Hexachlorobenzene	3.68	0.1	yes	8270C	µg/L	x	x	10 U	0.10 U		0.093 U	0.99 UJ	no	10 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
Hexachlorobutadiene	49.7		yes	8270C	µg/L	x	x	10 U	0.10 U		0.093 U	0.99 UJ	no	10 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
Hexachlorocyclopentadiene	0.07		yes	8270C	µg/L	x	x	10 U	0.50 U		0.46 U	5 UJ	yes	10 U	0.51 U		0.46 U	0.47 U	0.47 U	yes	yes
Hexachloroethane	9.4	10	yes	8270C	µg/L	x	x	10 U	0.50 U		0.46 U	5 UJ	no	10 U	0.51 U		0.46 U	0.47 U	0.47 U	no	yes
Hexachlorophene	30	30	yes	8270C	µg/L		x	10 U	25 U		23 R	250 UJ	yes	10 U	26 U		23 UQ	23 UJ	23 UJ	no	yes
Hexachloropropene			yes	8270C	µg/L		x	10 U	0.10 U		0.093 U	0.99 UJ	no	10 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
Indeno(1,2,3-cd)pyrene	300	0.2	yes	8270C	µg/L	x	x	10 U	**0.19 J**		0.093 U	0.99 UJ	no	10 U	0.10 U		0.093 U	0.093 UJ	0.093 UJ	no	yes
Isodrin			yes	8270C	µg/L			20 U			0.046 U	0.044 UJ	no	20 U			0.046 U	0.046 U	0.046 U	no	yes
Isophorone	129		yes	8270C	µg/L	x	x	10 U	**0.11 J**		0.093 U	0.99 UJ	no	10 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
Isosafrole			yes	8270C	µg/L		x	20 U	0.10 U		0.093 U	0.99 UJ	no	20 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
Kepone (Chlordecone)			yes	8270C	µg/L			10 UR			0.92 U	0.88 UJ	no	10 UR			0.92 U	0.92 U	0.92 U	no	yes
Methapyrilene			yes	8270C	µg/L		x	10 U	2.5 U		2.3 U	25 UJ	no	10 U	2.6 U		2.3 U	2.3 U	2.3 U	no	yes
Methyl Methanesulfonate			yes	8270C	µg/L		x	20 U	0.10 U		0.093 UJ	0.99 UJ	no	20 U	0.10 U		0.093 UJ	0.093 U	0.093 U	no	yes
Methyl parathion	0.5		yes	8270C	µg/L		x	10 U	0.20 U		0.19 U	2 UJ	yes	10 U	0.20 U		0.19 U	0.19 U	0.19 U	no	yes
Naphthalene	23.5		yes	8270C	µg/L	x	x	10 U	0.10 U		0.093 U	0.99 UJ	no	10 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
Nitrobenzene	66.8		yes	8270C	µg/L	x	x	10 U	0.10 U		0.093 U	0.99 UJ	no	10 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
N-Nitrosodiethylamine	768	10	yes	8270C	µg/L		x	20 U	0.10 U		0.093 U	0.99 UJ	no	20 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
N-Nitrosodimethylamine	10	10	yes	8270C	µg/L		x	20 U	0.25 U		0.23 U	2.5 UJ	no	20 U	0.26 U		0.23 U	0.23 U	0.23 U	no	yes
N-Nitrosodi-n-butylamine	10	10	yes	8270C	µg/L		x	10 U	0.1 U		0.093 U	0.99 UJ	no	10 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
N-Nitroso-di-n-propylamine	10	10	yes	8270C	µg/L		x	10 U	0.13 U		0.12 U	1.3 UJ	no	10 U	0.13 U		0.12 U	0.12 U	0.12 U	no	yes
N-nitrosodiphenylamine/Diphenylamine	58.5	10	yes	8270C	µg/L	x	x	10 U	0.37 U		0.34 U	3.7 UJ	no	10 U	0.38 U		0.34 U	0.34 U	0.35 U	no	yes
N-Nitrosomethylethylamine	10	10	yes	8270C	µg/L		x	10 U	0.20 U		0.19 U	2 UJ	no	10 U	0.20 U		0.19 U	0.19 U	0.19 U	no	yes
N-Nitrosomorpholine			yes	8270C	µg/L		x	10 U	0.10 U		0.093 U	0.99 UJ	no	10 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
N-Nitrosopiperidine			yes	8270C	µg/L		x	10 U	0.10 U		0.093 U	0.99 UJ	no	10 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
N-Nitrosopyrrolidine			yes	8270C	µg/L		x	10 U	0.10 U		0.093 U	0.99 UJ	no	10 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
O,O',O''-Triethyl phosphorothioate			yes	8270C	µg/L		x	20 U	0.13 U		0.12 U	1.3 UJ	no	20 U	0.13 U		0.12 U	0.12 U	0.12 U	no	yes
2-Toluidine/o-Toluidine			yes	8270C	µg/L		x	10 U	0.13 U		0.12 U	1.3 UJ	no	10 U	0.13 U		0.12 U	0.12 U	0.12 U	no	yes
p-Dimethylamino azobenzene			yes	8270C	µg/L		x	20 U	0.20 U		0.19 U	2 UJ	no	20 U	0.20 U		0.19 U	0.19 U	0.19 U	no	yes
Parathion/Ethyl Parathion	0.6	0.6	yes	8270C	µg/L		x		0.2 U		0.19 U	2 UJ	no		0.2 U		0.19 U	0.19 U	0.19 U	no	yes
Pentachlorobenzene	129	7	yes	8270C	µg/L		x	10 U	0.10 U		0.093 U	0.99 UJ	no	10 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
Pentachloronitrobenzene	0.3	0.3	yes	8270C	µg/L		x	10 U	0.50 U		0.46 U	5 UJ	yes	10 U	0.51 U		0.46 U	0.47 U	0.47 U	yes	yes
Pentachlorophenol	7.9		yes	8270C	µg/L	x	x	25 U	0.40 U		0.37 U	4 UJ	no	25 U	0.41 U		0.37 U	0.37 U	0.37 U	no	yes
Phenacetin			yes	8270C	µg/L		x	10 U	0.10 U		0.093 U	0.99 UJ	no	10 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
Phenanthrene	4.6	0.2	yes	8270C	µg/L	x	x	10 U	0.10 U		0.093 U	0.99 UJ	no	10 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
Phenol	300		yes	8270C	µg/L	x	x	10 U	0.13 U		0.12 U	1.3 UJ	no	10 U	0.13 U		0.12 U	0.12 U	0.12 U	no	yes
Phorate	0.5	0.5	yes	8270C	µg/L		x	10 U	0.20 U		0.19 UJ	2 UJ	yes	10 U	0.20 U		0.19 UJ	0.19 U	0.19 U	no	yes
Pronamide (Propyzamide or Kerb)			yes	8270C	µg/L		x	10 U	0.12 U		0.11 U	1.2 UJ	no	10 U	0.12 U		0.11 U	0.11 U	0.11 U	no	yes
Pyrene	11,000	2	yes	8270C	µg/L	x	x	10 U	**0.57**		0.12 U	1.3 UJ	no	10 U	0.13 U		0.12 U	0.12 U	0.12 U	no	yes
Pyridine	25		yes	8270C	µg/L		x	50 U	0.73 U		0.68 U	7.3 UJ	no	50 U	0.73 U		0.68 U	0.68 U	0.68 U	no	yes

Table 10. SWU-1 Surface Water Semi-Volatile Organic Compounds (SVOCs) (Continued)

SVOCs	Action Level (Surface Water)	PQL (Surface Water)	Retained for PMP Mod Nov-12	Method	Units	App B	App IX	Location						Location							Retained for PMP Modification Apr-14
								S1SW-01						S1SW-02							
								Date Collected					Jan-14	Date Collected						Jan-14	
								Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Dec-13 DUP	Retain	
Safrole, Total			yes	8270C	µg/L		x	10 U	0.10 U		0.093 U	0.99 UJ	no	10 U	0.10 U		0.093 U	0.093 U	0.093 U	no	yes
Sulfotepp (Tetraethyl Dithiopyrophosphate)			yes	8270C	µg/L		x	10 U	0.14 U		0.13 UJ	1.4 UJ	no	10 U	0.14 U		0.13 UJ	0.13 U	0.13 U	no	yes
Thionazin			yes	8270C	µg/L		x		0.20 U		0.19 U	2 UJ	no		0.2 U		0.19 U	0.19 U	0.19 U	no	yes

Not an Appendix B (App B) or Appendix IX (App IX) Compound
Not an Appendix B Compound
PQL listed in 62-777 FAC PQL Table E (Marine Surface Water)
NOAA SQuiRTs
Detected below Action level
Reporting limit above Action level
Reporting limit above Action level but below PQL
Detected above Action level
Compound retained during optimization analysis
No Available Data

Action Level and Appendix B (App B) Compounds (B&RE, 1998)
Appendix IX (App IX) Compounds from 40CFR Part 264 Appendix IX

Qualifiers
D – Dilution Result.
J – Estimated Concentration.
U – Non-Detect, Reporting Limit Estimated.
UJ – Non-Detect Analyte Rejected.
UR – Non-Detect Reporting Limit Listed.

Table 11. SWMU-1 Surface Water Pesticides

Pesticides	Action Level (Surface Water)	PQL (Surface Water)	Retained for PMP Mod Nov-12	Method	Units	App B	App IX	Location							Location								Retained for PMP Modification Apr-14
								S1SW-02							S1SW-04						S1SW-05						
								Date Collected						Jan-14	Date Collected					Jan-14	Date Collected					Jan-14	
								Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Dec-13 DUP	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	
4,4'-DDD	0.0064	0.08	yes	8081A	µg/L	x	x	0.10U	0.10 U		0.0092 UJ	0.0092 U	0.0092 U	no		0.10 U		0.0093 UJ	0.0093 UJ	no		0.1 U		0.0093 UJ	0.0093 UJ	no	yes
4,4'-DDE	0.14	0.08	yes	8081A	µg/L	x	x	0.10U	0.10 U		0.0092 UJ	0.0092 U	0.0092 U	no		0.10 U		0.0093 UJ	0.0093 UJ	no		0.1 U		0.0093 UJ	0.0093 UJ	no	yes
4,4'-DDT	0.0006	0.2	yes	8081A	µg/L	x	x	0.10U	0.10 U		0.0092 UJ	0.0092 U	0.0092 U	no		0.10 U		0.0093 UJ	0.0093 UJ	no		0.1 U		0.0093 UJ	0.0093 UJ	no	yes
Aldrin	0.0001	0.05	yes	8081A	µg/L	x	x	0.050U	0.070 U		0.0065 UJ	0.0064 U	0.0065 U	no		0.070 U		0.0065 UJ	0.0065 UJ	no		0.07 U		0.0065 UJ	0.0065 UJ	no	yes
alpha-BHC	0.34	0.05	yes	8081A	µg/L	x	x	0.050U	0.057 U		0.0053 UJ	0.0052 U	0.0053 U	no		0.057 U		0.0053 UJ	0.0053 UJ	no		0.057 U		0.0053 UJ	0.0053 UJ	no	yes
beta-BHC	0.046	0.05	yes	8081A	µg/L	x	x	0.050U	0.067 U		0.0062 UJ	0.0062 U	0.0062 U	no		0.067 U		0.0062 UJ	0.0063 UJ	no		0.067 U		0.0062 UJ	0.0062 UJ	no	yes
Chlordane (technical)	0.052	0.8	yes	8081A	µg/L	x	x	0.50U	1.3 U		0.12 UJ	0.12 U	0.12 U	no		1.3 U		0.12 UJ	0.12 UJ	no		1.3 U		0.12 UJ	0.12 UJ	no	yes
delta-BHC	0.34		yes	8081A	µg/L	x	x	0.050U	0.050 U		0.0046 UJ	0.0046 U	0.0046 U	no		0.050 U		0.0047 UJ	0.0047 UJ	no		0.05 U		0.0046 UJ	0.0047 UJ	no	yes
Dieldrin	0.0001	0.1	yes	8081A	µg/L	x	x	0.10U	0.10 U		0.0092 UJ	0.0092 U	0.0092 U	no		0.10 U		0.0093 UJ	0.0093 UJ	no		0.1 U		0.0093 UJ	0.0093 UJ	no	yes
Endosulfan I	0.0087	0.1	yes	8081A	µg/L	x	x	0.050U	0.050 U		0.0046 UJ	0.0046 U	0.0046 U	no		0.050 U		0.0047 UJ	0.0047 UJ	no		0.05 U		0.0046 UJ	0.0047 UJ	no	yes
Endosulfan II	0.0087	0.1	yes	8081A	µg/L	x	x	0.10U	0.10 U		0.0092 UJ	0.0092 U	0.0092 U	no		0.10 U		0.0093 UJ	0.0093 UJ	no		0.1 U		0.0093 UJ	0.0093 UJ	no	yes
Endosulfan sulfate	0.1	0.1	yes	8081A	µg/L	x	x	0.10U	0.10 U		0.0092 UJ	0.0092 U	0.0092 U	no		0.10 U		0.0093 UJ	0.0093 UJ	no		0.1 U		0.0093 UJ	0.0093 UJ	no	yes
Endrin	0.0023	0.2	yes	8081A	µg/L	x	x	0.10U	0.10 U		0.0092 UJ	0.0092 U	0.0092 U	no		0.10 U		0.0093 UJ	0.0093 UJ	no		0.1 U		0.0093 UJ	0.0093 UJ	no	yes
Endrin aldehyde			yes	8081A	µg/L	x	x	0.10U	0.16 U		0.015 UJ	0.015 U	0.015 U	no		0.16 U		0.015 UJ	0.015 UJ	no		0.16 U		0.015 UJ	0.015 UJ	no	yes
Endrin ketone			yes	8081A	µg/L	x		0.10U	0.10 U		0.0092 UJ	0.0092 U	0.0092 U	no		0.10 U		0.0093 UJ	0.0093 UJ	no		0.1 U		0.0093 UJ	0.0093 UJ	no	yes
gamma-BHC (Lindane)	0.063	0.1	yes	8081A	µg/L	x	x	0.050U	0.059 U		0.0054 UJ	0.0054 U	0.0054 U	no		0.059 U		0.0055 UJ	0.0055 UJ	no		0.059 U		0.0055 UJ	0.0055 UJ	no	yes
Heptachlor	0.0002	0.05	yes	8081A	µg/L	x	x	0.050U	0.070 U		0.0065 UJ	0.0064 U	0.0065 U	no		0.070 U		0.0065 UJ	0.0065 UJ	no		0.07 U		0.0065 UJ	0.0065 UJ	no	yes
Heptachlor epoxide	0.0036	0.08	yes	8081A	µg/L	x	x	0.050U	0.060 U		0.0055 UJ	0.0055 U	0.0055 U	no		0.060 U		0.0056 UJ	0.0056 UJ	no		0.06 U		0.0056 UJ	0.0056 UJ	no	yes
Methoxychlor	0.03	0.2	yes	8081A	µg/L	x	x	0.50U	0.13 U		0.012 UJ	0.012 U	0.012 U	no		0.13 U		0.012 UJ	0.012 UJ	no		0.13 U		0.012 UJ	0.012 UJ	no	yes
Toxaphene	0.0002	3	yes	8081A	µg/L	x	x	1.0U	5.0 U		0.46 UJ	0.46 U	0.46 U	no		5.0 U		0.47 UJ	0.47 UJ	no		5 U		0.46 UJ	0.47 UJ	no	yes

PQL listed in 62-777 FAC PQL Table E (Marine Surface Water)
Not an Appendix IX Compound
Detected below Action level
Reporting limit above Action level
Reporting limit above Action level but below PQL
Detected above Action level
Compound retained during optimization analysis
No Available Data

Action Level and Appendix B (App B) Compounds (B&RE, 1998)
Appendix IX (App IX) Compounds from 40CFR Part 264 Appendix IX

Qualifiers:
U – Non-Detect, Reporting Limit Estimated.
UJ – Non-Detect, Analyte Rejected..

Table 12. SWMU-1 Sediment Metals

Inorganics	Action Level (Sediment)	PQL (Sediment)	Retained for PMP Mod Nov-12	Method	Units	App B	TAL	Location							Location											
								S1SD-01							S1SD-02							S1SD-03					
								Date Collected						Jan-14	Date Collected						Jan-14	Date Collected					Jan-14
								Jan-03	Jan-03 Dup	Oct-10	Dec-11	Dec-12	Dec-13	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain
Aluminum	2,664		yes	6010B	mg/kg	x	x	**3,750 J**	**12,500 J**	**7,600**		**12,000**	**6,400**	yes	**3,790J**	**9,800**		**6,100**	**6,900**	yes	**16,200 J**	**2,900**		**3,800**	**6,300**	yes
Antimony	12		yes	6010B	mg/kg	x	x	**2.1 J**	**6 J**	1.9U		1.2 U	1 U	no	**7.4J**	1.3U		**6.3**	**6**	no	**3.1 J**	1.2U		0.95 U	0.8 U	no
Arsenic	7.24		yes	6010B	mg/kg	x	x	**5.7 J**	**15.5 J**	**4.9**	**5.1**	**4.5**	**3.6**	no	**10.1J**	**3.4**	**5.6**	**11**	**7.8**	yes	**1.7 J**	**4.1**	**4.6**	**2.0**	**3**	no
Barium	40		yes	6010B	mg/kg	x	x	**20 J**	**90.7 J**	**14**		**19**	**12**	no	**38.1J**	**17**		**60**	**58**	yes	**11.8 J**	**10**		**9.1**	**15**	no
Beryllium	0.1		yes	6010B	mg/kg	x	x	0.01 U	0.05 UJ	**0.31J**		**0.55**	**0.29**	yes	0.03 UJ	**0.41J**		**0.24**	**0.21**	yes	0.01 U	**0.13J**		**0.15**	**0.23**	yes
Cadmium	0.676		yes	6010B	mg/kg	x	x	**2.4 J**	**10.8 J**	**0.45J**		**0.24**	**0.16**	no	**6.1J**	0.34U		**2.5**	**4**	yes	**24.7 J**	**0.70J**		**0.32**	**0.39**	no
Calcium			yes	6010B	mg/kg	x	x	**182,000 J**	**703,000 J**	**220,000D**		**97,000**	**110,000**	no	184,000 UJ	**180,000D**		**290,000 J**	**240,000**	no	**30,300 J**	**170,000D**		**120,000 J**	**190,000**	no
Chromium	52.3		yes	6010B	mg/kg	x	x	**20.1 J**	**660 J**	**25**		**33**	**17 J**	no	**20.2J**	**28**		**36**	**31 J**	no	**720 J**	**12**		**13**	**18 J**	no
Cobalt	0.48		yes	6010B	mg/kg	x	x	**1.6**	**11.3 J**	**0.89J**		**1.1**	**0.98**	yes	**2.0J**	**0.95J**		**2.6**	**3**	yes	**1.2**	**0.55J**		**0.56**	**1.1**	yes
Copper	18.7		yes	6010B	mg/kg	x	x	**122 J**	**443 J**	**56**		**8.1**	**4.5**	no	**389J**	**33**		**180**	**210**	yes	**988 J**	**28**		**21**	**25**	yes
Iron	2,398		yes	6010B	mg/kg	x	x	**13,400 J**	**42,500 J**	**6,300**		**7,400**	**4,200**	yes	**13,100J**	**6,600**		**18,000**	**16,000**	yes	**4,090 J**	**4,300**		**2,800**	**4,300**	yes
Lead	34.18		yes	6010B	mg/kg	x	x	**161 J**	**594 J**	**57**	**24**	**17**	**9.7 J**	no	**440J**	**38**	**190**	**260**	**340 J**	yes	**3,290 J**	**43**	**140**	**29**	**33 J**	no
Magnesium			yes	6010B	mg/kg	x	x	**6,530 J**	**23,200 J**	**8,100**		**7,600**	**5,100**	no	**12,600 J**	**8,000**		**12,000**	**9,500**	no	**3,950 J**	**6,600**		**4,600**	**7,800**	no
Manganese	460		yes	6010B	mg/kg	x	x	**65.3 J**	**320 J**	**31**		**23**	**16**	no	**150J**	**31**		**130**	**140**	no	**106 J**	**31**		**19**	**24**	no
Mercury	0.13	0.02	yes	7471A	mg/kg	x	x	**0.69 J**	**2.5 J**	**0.24**		0.0099 U	0.081 U	no	**1.3J**	**0.10**		**1.6**	**1.7**	yes	**2.5 J**	**0.066**		0.092 U	**0.12 J**	no
Nickel	15.9		yes	6010B	mg/kg	x	x	**11.4 J**	**428 J**	**7.6J**		**7.3**	**4.2**	no	**22.5J**	**7.2**		**20**	**24**	yes	**11.8 J**	**4.4J**		**4.0**	**5.6**	no
Potassium			yes	6010B	mg/kg	x	x	**1,210 J**	**3930 J**	**1,500**		**2,700**	**1,600**	no	**2,080 J**	**2,100**		**1,600**	**1,300**	no	**665 J**	**660**		**1,300**	**1,500**	no
Selenium	1.42		yes	6010B	mg/kg	x	x	0.21 U	**1.4 J**	1.2U	**1.2J**	**1.6**	**0.91 J**	yes	**0.6J**	1.7U	0.93U	**0.71 J**	**0.64 J**	no	**0.26**	0.74U	**0.89J**	0.48 U	**0.59 J**	no
Silver	0.733		yes	6010B	mg/kg	x	x	**1.5**	**5.1 J**	**0.50J**		**0.20 J**	**0.17 J**	no	**6.3J**	0.27U		**2.3**	**3.5**	yes	**2**	**0.25J**		**0.14 J**	**0.28**	no
Sodium			yes	6010B	mg/kg	x	x	**19,900 J**	**69,400 J**	**5,800D**		**21,000**	**17,000**	no	**43,800 J**	**12,000D**		**18,000**	**20,000**	no	**15,600 J**	**5,900D**		**13,000**	**15,000**	no
Thallium			yes	6010B	mg/kg	x	x	0.28 U	1.2 UJ	4.8U		**0.15 J**	**0.078 J**	no	0.73 UJ	3.4U		**0.12 J**	**0.095 J**	no	0.29 U	3.0U		**0.049 J**	**0.052 J**	no
Tin	1.98		yes	6010B	mg/kg	x		**34.9 J**	**134 J**		45U	6.3 U	5.2 U	yes	**30.6J**		**31J**	**49**	**49**	yes	9 U		34U	4.8 U	4.1 U	yes
Vanadium	10.44		yes	6010B	mg/kg	x	x	**10.8 J**	**32.2 J**	**16**	**21**	**26**	**13**	yes	**12.5J**	**17**	**16**	**21**	**21**	yes	**10.6 J**	**7.6**	**17**	**8.0**	**11**	yes
Zinc	124		yes	6010B	mg/kg	x	x	**264 J**	**1,530 J**	**98**		**18**	**8.7**	no	**1,890J**	**79**		**350**	**490**	yes	**696 J**	**73**		**40**	**50**	no

Inorganics	Action Level (Sediment)	PQL (Sediment)	Retained for PMP Mod Nov-12	Method	Units	App B	TAL	Location													Retained for PMP
								S1SD-04							S1SD-05						
								Date Collected						Jan-14	Date Collected						Jan-14
								Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain		Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	Modification
																					Apr-14
Aluminum	2,664		yes	6010B	mg/kg	x	x	**4010 J**	**8,000**		**8,700**	**4,100**	yes		**489 J**	**550**		**1,600**	**360**	no	yes
Antimony	12		yes	6010B	mg/kg	x	x	2.4 U	**3.5J**		**2.2 J**	**5.1**	no		0.24 UJ	1.6U		2.6 U	0.9 U	no	yes
Arsenic	7.24		yes	6010B	mg/kg	x	x	**8.1 J**	**14**	**5.1**	**5.9**	**7.1**	no		**0.71 J**	**3.3J**	**7.4J**	**23**	**12**	yes	yes
Barium	40		yes	6010B	mg/kg	x	x	**6.6 J**	**25**		**15**	**21**	no		**8 J**	**7.0**		**7.2**	**6.7**	no	yes
Beryllium	0.1		yes	6010B	mg/kg	x	x	0.19 U	**0.21J**		**0.33**	**0.12 J**	yes		0.02 U	0.04U		0.13 U	0.045 U	yes	yes
Cadmium	0.676		yes	6010B	mg/kg	x	x	4.5 U	**4.1**		**1.2**	**2.8**	yes		**0.17 J**	0.4U		**0.11 J**	**0.028 U**	no	yes
Calcium			yes	6010B	mg/kg	x	x	**128000 J**	**300,000D**		**65,000**	**220,000**	no		**340,000 J**	**310,000D**		**230,000**	**370,000**	no	yes
Chromium	52.3		yes	6010B	mg/kg	x	x	**22.2 J**	**62**		**27**	**29 J**	no		**3 J**	**8.2**		**58**	**23 J**	yes	yes
Cobalt	0.48		yes	6010B	mg/kg	x	x	**0.57 J**	**3.2**		**1.2**	**1.9**	yes		0.11 U	0.40U		**0.48**	**0.8**	yes	yes
Copper	18.7		yes	6010B	mg/kg	x	x	**109 J**	**250**		**95**	**100**	yes		**7.9 J**	**14**		**62**	**17**	yes	yes
Iron	2,398		yes	6010B	mg/kg	x	x	**1610 J**	**31,000**		**10,000**	**4,400**	yes		**375 J**	**510**		**2,600**	**370**	yes	yes
Lead	34.18		yes	6010B	mg/kg	x	x	**112 J**	**540**	**170J**	**91**	**160 J**	yes		**23.8 J**	**18**	**20**	**39**	**10 J**	yes	yes
Magnesium			yes	6010B	mg/kg	x	x	**12200 J**	**13,000**		**9,300**	**9,000**	no		**4,300 J**	**6,600**		**10,000**	**3,300**	no	yes
Manganese	460		yes	6010B	mg/kg	x	x	**7 J**	**110**		**25**	**38**	no		**6 J**	**5.2**		**6.5**	**3.2**	no	yes
Mercury	0.13	0.02	yes	7471A	mg/kg	x	x	**0.37 J**	**0.46**		**0.49**	**0.89**	yes		**0.01 J**	0.017U		0.21 U	0.072 U	yes	yes
Nickel	15.9		yes	6010B	mg/kg	x	x	**9.2 J**	**56**		**10**	**16**	yes		3 U	**0.78J**		**6.3**	**1.7**	no	yes
Potassium			yes	6010B	mg/kg	x	x	**3400 J**	**2,300**		**3,000**	**1,500**	no		**538 J**	**1,000**		**3,100**	**590**	no	yes
Selenium	1.42		yes	6010B	mg/kg	x	x	**1.1 J**	1.5U	2.5U	**1.0 J**	0.81 U	no		0.42 U	1.0U	2.0U	1.3 U	0.45 U	no	yes
Silver	0.733		yes	6010B	mg/kg	x	x	0.91 UJ	**0.57J**		**1.3**	**1.9**	yes		0.1 U	0.32U		0.26 U	0.09 U	no	yes
Sodium			yes	6010B	mg/kg	x	x	**63600 J**	**27,000D**		**39,000**	**33,000**	no		**12,900 J**	**16,000D**		**55,000**	**13,000**	no	yes
Thallium			yes	6010B	mg/kg	x	x	1.1 UJ	6.0U		**0.12 J**	0.081 U	no		0.56 U	4.0U		0.13 U	0.045 U	no	yes
Tin	1.98		yes	6010B	mg/kg	x		**9.1 U**		50UJ	**13 J**	**17 J**	yes		2.9 U		39U	**13 U**	4.7 U	yes	yes
Vanadium	10.44		yes	6010B	mg/kg	x	x	**33.7 J**	**22**	**14**	**15**	**17**	yes		**2.3 J**	**1.6J**	**3.1**	**11**	**1.8**	yes	yes
Zinc	124		yes	6010B	mg/kg	x	x	**253 J**	**1,500**		**140**	**290**	yes		**158 J**	**31**		**76**	**17**	no	yes

Not a Target Analyte List (TAL) Metal
Detected below Action level
Reporting limit above Action level
Detected above Action level
Compound retained during optimization analysis
No Available Data

Action Level and Appendix B (App B) Compounds (B&RE, 1998)
Target Analyte List (TAL) Compounds (B&RE, 1998)

Qualifiers:
D - Dilution Result.
J - Estimated concentration.
U - Non-detect, Reporting limit estimated.
UJ = Non-detect, Analyte Rejected.

Table 13. SWMU-1 Sediment Semi-Volatile Organic Compounds (SVOCs)

SVOCs	Action Level (Sediment)	PQL (Sediment)	Retained for PMP Mod Nov-12	Method	Units	App B	App IX	Location: S1SD-01 Date Collected: Jan-03 Dup	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Jan-14 Retain	S1SD-02 Date Collected: Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Jan-14 Retain	S1SD-03 Date Collected: Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Jan-14 Retain	S1SD-04 Date Collected: Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Jan-14 Retain
2-Methylnaphthalene	20.2		yes	8270C	µg/kg	x	x	23,000 UJ	6,200 U			8.7 U	**27**	yes				**220**	**2,900**	yes				**14**	**23**	yes				110 U	**98**	yes
Acenaphthene	6.71		yes	8270C	µg/kg	x	x	23,000 UJ	6,200 U			8.7 U	7 U	yes				**380**	**14,000**	yes				**6.5 J**	5.9 U	no				110 U	**95**	yes
Acenaphthylene	5.87		yes	8270C	µg/kg	x	x	**35,000 J**	**9,300 J**			**9.5 J**	7 U	yes				**880**	**10,000**	yes				**10 J**	**74**	yes				**480**	**15 J**	yes
Anthracene	46.9		yes	8270C	µg/kg	x	x	23,000 UJ	6,200 U			8.7 U	7 U	no				**240**	84 U	yes				**9.2 J**	**24**	no				**150 J**	**190**	yes
Benzo(a)anthracene	74.8		yes	8270C	µg/kg	x	x	**60,000 J**	**17,000 J**			**15 J**	**32**	no				**4,200**	**14,000**	yes				**59**	**55**	no				**590**	**330**	yes
Benzo(a)pyrene	88.8		yes	8270C	µg/kg	x	x	**62,000 J**	**16,000 J**		**56**	**26 J**	**44**	no			**13,000 D**	**4100 J**	**13,000**	yes			**47**	**59 J**	**73**	no			**22,000 D**	**980 J**	**280**	yes
Benzo(b)fluoranthene	3,200		yes	8270C	µg/kg	x	x	**20,000 J**	**16,000**			**27**	**35**	no				**3,600 M**	**8,400**	yes				**87 M**	**68**	no				**1,000 M**	**320**	no
Benzo(g,h,i)perylene	670		yes	8270C	µg/kg	x	x	**37,000 J**	**10,000 J**		**34**	**13 J**	**29**	no			**5,200 D**	**1,900**	**4,500**	yes			**27**	**26**	**49**	no			**11,000 D**	**490**	**130**	no
Benzo(k)fluoranthene	14,000		yes	8270C	µg/kg	x	x	23,000 UJ	**8,500 J**			**12 J**	**43**	no				**1,300 M**	**8,300**	no				**36 M**	**70**	no				**410 M**	**260**	no
Chrysene	108		yes	8270C	µg/kg	x	x	**56,000 J**	**18,000 J**		**49**	**22 J**	**45**	no			**14,000 D**	**4,300**	**15,000**	yes			**52**	**74 J**	**81**	no			**33,000 D**	**840**	**330**	yes
Dibenzo(a,h)anthracene	6.22		yes	8270C	µg/kg	x	x	23,000 UJ	6,200 U		8.2U	8.7 U	**12 J**	yes			610 U	**550 J**	**1,200**	yes			5.8 U	**7.9 J**	5.9 U	yes			880 U	**170 J**	**48**	yes
Fluoranthene	113		yes	8270C	µg/kg	x	x	**130,000 J**	**37,000 J**			**27**	**80**	no				**8,400**	84 U	yes				**130**	**83**	yes				**640**	**710**	yes
Fluorene	19		yes	8270C	µg/kg	x	x	23,000 UJ	6,200 U			8.7 U	7 U	yes				86 U	84 U	yes				**7.3 J**	5.9 U	no				110 U	**100**	yes
Indeno(1,2,3-cd)pyrene	600		yes	8270C	µg/kg	x	x	**33,000 J**	**9,200 J**		**22**	**9.4 J**	**22**	no			**3,800 D**	**1400 J**	**3,700**	yes			**19**	**19 J**	**43**	no			**6,900 D**	**410 J**	**130**	no
Naphthalene	34.6		yes	8270C	µg/kg	x	x	23,000 UJ	6,200 U			8.7 U	7 U	yes				**190**	**3,100**	yes				**10 J**	5.9 U	no				110 U	**59**	yes
Phenanthrene	86.7		yes	8270C	µg/kg	x	x	23,000 UJ	6,200 U			8.7 U	**25**	yes				**190**	84 U	yes				**64**	5.9 U	no				**130 J**	**690**	yes
Pyrene	153		yes	8270C	µg/kg	x	x	**160,000 J**	**42,000 J**		**120**	**55**	**140**	no			**44,000 D**	**16,000**	**820**	yes			**93**	**150**	**170**	yes			**89,000 D**	**1,300**	**630**	yes

SVOCs	Action Level (Sediment)	PQL (Sediment)	Retained for PMP Mod Nov-12	Method	Units	App B	App IX	Location: S1SD-05 Date Collected: Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Jan-14 Retain	Retained for PMP Modification Apr-14
2-Methylnaphthalene	20.2		yes	8270C	µg/kg	x	x				17 U	6.3 U	no	yes
Acenaphthene	6.71		yes	8270C	µg/kg	x	x				17 U	6.3 U	yes	yes
Acenaphthylene	5.87		yes	8270C	µg/kg	x	x				**140**	**18**	yes	yes
Anthracene	46.9		yes	8270C	µg/kg	x	x				**25 J**	6.3 U	no	yes
Benzo(a)anthracene	74.8		yes	8270C	µg/kg	x	x				17 U	6.3 U	no	yes
Benzo(a)pyrene	88.8		yes	8270C	µg/kg	x	x			2.5 U	17 U	6.3 U	no	yes
Benzo(b)fluoranthene	3,200		yes	8270C	µg/kg	x	x				17 U	6.3 U	no	yes
Benzo(g,h,i)perylene	670		yes	8270C	µg/kg	x	x			7.0 U	17 U	6.3 U	no	yes
Benzo(k)fluoranthene	14,000		yes	8270C	µg/kg	x	x			14 U	17 U	6.3 U	no	yes
Chrysene	108		yes	8270C	µg/kg	x	x			7.0 U	17 U	6.3 U	no	yes
Dibenzo(a,h)anthracene	6.22		yes	8270C	µg/kg	x	x			7.0 U	17 U	6.3 U	yes	yes
Fluoranthene	113		yes	8270C	µg/kg	x	x				17 U	6.3 U	no	yes
Fluorene	19		yes	8270C	µg/kg	x	x				17 U	6.3 U	no	yes
Indeno(1,2,3-cd)pyrene	600		yes	8270C	µg/kg	x	x			7.0 U	17 U	6.3 U	no	yes
Naphthalene	34.6		yes	8270C	µg/kg	x	x			14 U	**150**	6.3 U	yes	yes
Phenanthrene	86.7		yes	8270C	µg/kg	x	x			14 U	**29 J**	6.3 U	no	yes
Pyrene	153		yes	8270C	µg/kg	x	x			7.0 U	17 U	6.3 U	no	yes

Detected below Action level
Reporting limit above Action level
Detected above Action level
Compound retained during optimization analysis
No Available Data
Action Level and Appendix B (App B) Compounds (B&RE, 1998)
Appendix IX (App IX) Compounds from 40CFR Part 264 Appendix IX
Qualifiers:
M - Manually integrated analyte.
J - Estimated concentration.
U - Non-detect, Reporting limit estimated.
UJ - Non-detect, Analyte Rejected.

Table 14. SWMU-1 Sediment Pesticides

Pesticides	Action Level (Sediment)	PQL (Sediment)	Retained for PMP Mod Nov-12	Method	Units	App B	App IX	Location																	
								S1SD-01							S1SD-02							S1SD-03					
								Date Collected						Jan-14	Date Collected					Jan-14		Date Collected					Jan-14
								Jan-03	Jan-03 Dup	Oct-10	Dec-11	Dec-12	Dec-13	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain
4,4'-DDD	1.78		yes	8081A	µg/kg	x	x	**120 J**	**23**	**42 J**	**5.1J**	**1.3 J**	6.9 UJ	yes	**55 J**	0.56 U	**91**	**15 J**	**150 J**	yes	**130**	**14 MJ**	**8.1**	**1.2 J**	**9.4 J**	yes
4,4'-DDE	2.07		yes	8081A	µg/kg	x	x	**67 J**	**28**	**14 J**	**4.6J**	**4.5 J**	6.9 UJ	yes	**160 J**	**7.7**	**48**	**17 J**	**110 J**	yes	**67**	**28**	**34**	**5.8 J**	46 U	yes
4,4'-DDT	1.76		yes	8081A	µg/kg	x	x	6.2 U	6.3 UJ	**46 J**	**2.1J**	0.87 UJ	6.9 UJ	yes	**11 J**	**1.9 J**	**6.1MJ**	3.4 R	4.1 UJ	yes	**49 J**	0.50 U	**2.3J**	**3.2 J**	**5.9 J**	yes
Aldrin	60		yes	8081A	µg/kg	x	x	3.2 U	12 UJ	2.3 UJ		1.2 U	9.4 UJ	no	7.9 UJ	0.77 U		4.6 R	5.6 UJ	no	3.0 U	0.68 U		0.85 U	4 U	no
alpha-BHC	1.05	2	yes	8081A	µg/kg	x	x	3.2 U	12 UJ	0.87 UJ		0.45 U	3.5 UJ	yes	7.9 UJ	0.29 U		1.8 R	2.1 UJ	yes	3.0 U	**1.1 J**		0.32 U	1.5 U	yes
beta-BHC	5	2	yes	8081A	µg/kg	x	x	3.2 UR	12 UJ	1.7 UJ		0.87 U	6.9 UJ	yes	7.9 UJ	0.56 U		3.4 R	**17 J**	no	3.0 U	0.50 U		0.62 U	3 U	no
Chlordane (technical)	490		yes	8081A	µg/kg	x	x	32 U	120 UJ	15 U		7.6 U	60 UJ	no	79 UJ	5.0 U		30 R	36 UJ	no	30 U	4.4 U		5.5 U	26 U	no
delta-BHC	3		yes	8081A	µg/kg	x	x	3.2 U	12 UJ	0.87 UJ		0.45 U	3.5 UJ	yes	7.9 UJ	0.29 U		1.8 R	2.1 UJ	no	3.0 U	0.26 U		0.32 U	1.5 U	no
Dieldrin	0.715	3	yes	8081A	µg/kg	x	x	6.2 U	23 UJ	1.7 U		0.87 U	6.9 UJ	yes	15 UJ	0.56 U		3.4 R	4.1 UJ	yes	5.8 U	0.50 U		0.62 U	3 U	yes
Endosulfan I	2.9	4	yes	8081A	µg/kg	x	x	3.2 U	12 UJ	0.87 U		0.45 U	3.5 UJ	no	7.9 UJ	0.29 U		1.8 R	2.1 UJ	no	3.0 U	0.26 U		0.32 U	1.5 U	no
Endosulfan II	14	4	yes	8081A	µg/kg	x	x	6.2 U	23 UJ	1.7 UJ		0.87 U	6.9 UJ	no	15 UJ	0.56 U		3.4 R	4.1 UJ	no	5.8 U	0.50 U		0.62 U	3 U	no
Endosulfan sulfate		4	yes	8081A	µg/kg	x	x	6.2 UR	23 UJ	1.7 UJ		0.87 U	6.9 UJ	no	15 UJ	0.56 U		3.4 R	4.1 UJ	no	5.8 U	0.50 U		0.62 U	3 U	no
Endrin	3.3	5	yes	8081A	µg/kg	x	x	6.2 U	23 UJ	3.7 UJ		1.9 U	15 UJ	yes	15 UJ	1.2 U		7.5 R	9.1 UJ	yes	5.8 U	1.1 U		1.4 U	6.5 U	yes
Endrin aldehyde	23,000		yes	8081A	µg/kg	x	x	6.2 U	23 UJ	1.7 UJ		0.89 U	7.1 UJ	no	15 UJ	0.58 U		3.5 R	4.2 UJ	no	5.8 U	0.51 U		0.64 U	3 U	no
Endrin ketone			yes	8081A	µg/kg	x		6.2 U	23UJ	1.7 UJ		0.87 U	6.9 UJ	no	15 UJ	0.56 U		3.4 R	4.1 UJ	no	5.8 U	0.50 U		0.62 U	3 U	no
gamma-BHC (Lindane)	1.22		yes	8081A	µg/kg	x	x	3.2 UJ	**14 J**	0.87 UJ		0.45 U	3.5 UJ	yes	7.9 UJ	0.29 U		1.8 R	2.1 UJ	yes	3.0 U	0.26 U		0.32 U	1.5 U	yes
Heptachlor	4.9		yes	8081A	µg/kg	x	x	3.2 U	12 UJ	0.87 UJ		0.45 U	3.5 UJ	no	7.9 UJ	0.29 U		1.8 R	2.1 UJ	no	3.0 U	0.26 U		0.32 U	1.5 U	no
Heptachlor epoxide	300	2	yes	8081A	µg/kg	x	x	**11 J**	12 UJ	0.87 UJ		0.45 U	3.5 UJ	no	7.9 UJ	0.29 U		1.8 R	2.1 UJ	no	**7.5 J**	0.26 U		0.32 U	1.5 U	no
Methoxychlor	19		yes	8081A	µg/kg	x	x	32 UR	**10 J**	1.8 UJ		0.92 UJ	7.3 UJ	no	79 UJ	0.60 U		3.6 R	4.4 UJ	no	30 U	0.53 U		0.66 R	3.1 U	no
Toxaphene	28	100	yes	8081A	µg/kg	x	x	62 U	230 UJ	**560 J**		160 U	1,300 UJ	yes	150 UJ	100 U		620 R	750 UJ	yes	58 U	91 U		110 U	540 U	yes

Pesticides	Action Level (Sediment)	PQL (Sediment)	Retained for PMP Mod Nov-12	Method	Units	App B	App IX	Location												Retained for PMP Modification Apr-14
								S1SD-04						S1SD-05						
								Date Collected					Jan-14	Date Collected					Jan-14	
								Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	
4,4'-DDD	1.78		yes	8081A	µg/kg	x	x	**42 J**	**710**	**170**	**23 J**	**75**	yes	**20**	**6.7 J**	**7.1MJ**	17 U	3.1 U	yes	yes
4,4'-DDE	2.07		yes	8081A	µg/kg	x	x	**120 J**	**5,000J**	**74**	**47 J**	**160**	yes	**250**	**47**	**31J**	17 UJ	**18 J**	yes	yes
4,4'-DDT	1.76		yes	8081A	µg/kg	x	x	**290 J**	**750**	**11J**	**8.0 J**	5.5 U	yes	**120**	**7.7**	**8.3**	17 UJ	3.1 U	yes	yes
Aldrin	60		yes	8081A	µg/kg	x	x	8.8 UJ	15 U		1.5 U	7.5 U	no	10 U	0.94 U		23 U	4.2 U	no	yes
alpha-BHC	1.05	2	yes	8081A	µg/kg	x	x	8.8 UJ	**900J**		0.57 U	2.8 U	yes	10 U	0.36 U		8.7 U	1.6 U	yes	yes
beta-BHC	5	2	yes	8081A	µg/kg	x	x	8.8 UJ	11 U		1.1 U	5.5 U	yes	10 U	0.69 U		17 U	3.1 U	yes	yes
Chlordane (technical)	490		yes	8081A	µg/kg	x	x	8.8 UJ	96 U		0.57 U	48 U	no	100 U	6.1 U		150 U	27 U	no	yes
delta-BHC	3		yes	8081A	µg/kg	x	x	**5.9 J**	5.6 U		1.1 U	2.8 U	no	10 U	0.36 U		8.7 U	1.6 U	yes	yes
Dieldrin	0.715	3	yes	8081A	µg/kg	x	x	17 UJ	11 U		9.8 U	5.5 U	yes	20 U	0.69 U		17 U	3.1 U	yes	yes
Endosulfan I	2.9	4	yes	8081A	µg/kg	x	x	8.8 UJ	5.6 U		0.57 U	2.8 U	no	10 U	0.36 U		8.7 U	1.6 U	yes	yes
Endosulfan II	14	4	yes	8081A	µg/kg	x	x	17 UJ	11 U		1.1 U	5.5 U	no	20 U	0.69 U		17 U	3.1 U	yes	yes
Endosulfan sulfate		4	yes	8081A	µg/kg	x	x	17 UJ	11 U		1.1 U	5.5 U	no	20 U	0.69 U		17 U	3.1 U	no	yes
Endrin	3.3	5	yes	8081A	µg/kg	x	x	17 UJ	24 U		2.5 U	12 U	yes	20 U	1.5 U		37 U	6.9 U	yes	yes
Endrin aldehyde	23,000		yes	8081A	µg/kg	x	x	17 UJ	11 U		1.1 U	5.7 U	no	20 U	0.71 U		17 U	3.2 U	no	yes
Endrin ketone			yes	8081A	µg/kg	x		17 UJ	11 U		1.1 U	5.5 U	no	20 U	0.69 U		17 U	3.1 U	no	yes
gamma-BHC (Lindane)	1.22		yes	8081A	µg/kg	x	x	8.8 UJ	**7.6 J**		0.57 U	2.8 U	yes	10 U	0.36 U		8.7 U	1.6 U	yes	yes
Heptachlor	4.9		yes	8081A	µg/kg	x	x	8.8 UJ	5.6 U		0.57 U	2.8 U	no	10 U	0.36 U		8.7 U	1.6 U	yes	yes
Heptachlor epoxide	300	2	yes	8081A	µg/kg	x	x	8.8 UJ	5.6 U		0.57 U	2.8 U	no	10 U	0.36 U		8.7 U	1.6 U	no	yes
Methoxychlor	19		yes	8081A	µg/kg	x	x	88 UJ	12 U		1.2 R	5.9 U	no	100 U	0.73 U		18 UJ	3.3 U	no	yes
Toxaphene	28	100	yes	8081A	µg/kg	x	x	170 UJ	2,000 U		200 U	1000 U	yes	200 U	130 U		3,100 U	570 U	yes	yes

Not an Appendix IX Compound
Detected below Action level
Reporting limit above Action level
Reporting limit above Action level but below PQL
Detected above Action level
Compound retained during optimization analysis
No Available Data
Action Level and Appendix B (App B) Compounds (B&RE, 1998)
Appendix IX (App IX) Compounds from 40CFR Part 264 Appendix IX

Qualifiers:
D - Dilution Result.
J - Estimated concentration.
U - Non-detect, Reporting limit estimated.
UJ - Non-detect, Analyte Rejected.
UR - Non-detect, Reporting limit listed.
R - Analyte result is rejected.

Table 15. SWMU-2 Groundwater Metals

Inorganics	Action Level (Ground-water)	PQL (Ground-water)	Action Level (Surface Water)	PQL (Surface Water)	Retained for PMP Mod Nov-12	Method	Units	App B	TAL	Location													
										S2MW-05							S2MW-06						
										Date Collected						Jan-14	Date Collected						Jan-14
										Jan-03	Oct-10	Dec-11	Dec-11 Dup	Dec-12	Dec-13	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain
Aluminum	37,000		1,500		no	6010B	µg/L	x	x							no						no
Antimony	6		4,300		no	6020	µg/L	x	x							no						no
Arsenic	50		50		no	6010B	µg/L	x	x							no						no
Barium	2,000		10,000		no	6010B	µg/L	x	x							no						no
Beryllium	4		0.28		no	6010B	µg/L	x	x							no						no
Cadmium	5		9.3		no	6010B	µg/L	x	x							no						no
Calcium					no	6010B	µg/L	x	x							no						no
Chromium	100		50		no	6010B	µg/L	x	x							no						no
Cobalt	2,200		35,000		no	6010B	µg/L	x	x							no						no
Copper	1,500		2.9		no	6010B	µg/L	x	x							no						no
Iron	11,000		300		no	6010B	µg/L	x	x							no						no
Lead	15		5.6		no	6010B	µg/L	x	x			5.0 U	5.0 U			no			5.0 U			no
Magnesium					no	6010B	µg/L	x	x							no						no
Manganese	840		10		no	6010B	µg/L	x	x							no						no
Mercury	2		1.26		no	7470A	µg/L	x	x							no						no
Nickel	100		8.3		no	6010B	µg/L	x	x							no						no
Potassium					no	6010B	µg/L	x	x							no						no
Selenium	50		71		no	6010B	µg/L	x	x							no						no
Silver	180		2.3		no	6010B	µg/L	x	x							no						no
Sodium	160,000				no	6010B	µg/L	x	x							no						no
Thallium	4.62		7.3		no	6020	µg/L	x	x							no						no
Tin	22,000		0.01		yes	6010B	µg/L	x				14.0 U	14.0 U	**1.6 J**	1.4 U	yes			14.0 U	1.4 U	1.4 U	yes
Vanadium	260		10,000		no	6010B	µg/L	x	x							no						no
Zinc	11,000		86		no	6010B	µg/L	x	x							no						no

Inorganics	Action Level (Ground-water)	PQL (Ground-water)	Action Level (Surface Water)	PQL (Surface Water)	Retained for PMP Mod Nov-12	Method	Units	App B	TAL	Location							Retained for PMP Modification Apr-14
										S2MW-07							
										Date Collected						Jan-14	
										Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Dec-13 DUP	Retain	
Aluminum	37,000		1,500		no	6010B	µg/L	x	x							no	no
Antimony	6		4,300		no	6020	µg/L	x	x							no	no
Arsenic	50		50		no	6010B	µg/L	x	x							no	no
Barium	2,000		10,000		no	6010B	µg/L	x	x							no	no
Beryllium	4		0.28		no	6010B	µg/L	x	x							no	no
Cadmium	5		9.3		no	6010B	µg/L	x	x							no	no
Calcium					no	6010B	µg/L	x	x							no	no
Chromium	100		50		no	6010B	µg/L	x	x							no	no
Cobalt	2,200		35,000		no	6010B	µg/L	x	x							no	no
Copper	1,500		2.9		no	6010B	µg/L	x	x							no	no
Iron	11,000		300		no	6010B	µg/L	x	x							no	no
Lead	15		5.6		no	6010B	µg/L	x	x			5.0 U				no	no
Magnesium					no	6010B	µg/L	x	x							no	no
Manganese	840		10		no	6010B	µg/L	x	x							no	no
Mercury	2		1.26		no	7470A	µg/L	x	x							no	no
Nickel	100		8.3		no	6010B	µg/L	x	x							no	no
Potassium					no	6010B	µg/L	x	x							no	no
Selenium	50		71		no	6010B	µg/L	x	x							no	no
Silver	180		2.3		no	6010B	µg/L	x	x							no	no
Sodium	160,000				no	6010B	µg/L	x	x							no	no
Thallium	4.62		7.3		no	6020	µg/L	x	x							no	no
Tin	22,000		0.01		yes	6010B	µg/L	x				14.0 U	1.4 U	1.4 U	1.4 U	yes	yes
Vanadium	260		10,000		no	6010B	µg/L	x	x							no	no
Zinc	11,000		86		no	6010B	µg/L	x	x							no	no

Not a Target Analyte List (TAL) Metal
Detected above Surface Water Action level
Reporting limit above Action level
Compound retained during optimization analysis
* Sodium concentrations reflect seawater values (i.e., near 10,700,000 µg/L)
No Available Data
Action Level and Appendix B (App B) Compounds (B&RE, 1998)
Target Analyte List (TAL) Compounds (B&RE, 1998)
Qualifiers:
J - Estimated concentration.
U - Non-detect, Reporting limit estimated.

Table 16. SWMU-2 Groundwater Pesticides

Pesticides/PCBs	Action Level (Ground-water)	PQL (Ground-water)	Action Level (Surface Water)	PQL (Surface Water)	Retained for PMP Mod Nov-12	Method	Units	App B	App IX	Location												
										S2MW-05							S2MW-06					
										Date Collected						Jan-14	Date Collected					Jan-14
										Jan-03	Oct-10	Dec-11	Dec-11 Dup	Dec-12	Dec-13	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain
4,4'-DDD	0.28		0.0064	0.08	yes	8081A	µg/L	x	x	**0.050 J**	**0.41**	0.0061UJ	0.0061UJ	**0.0076 J**	**0.007 J**	yes	**1.1**	0.1 U	**0.2**	**0.10 J**	**0.075 J**	yes
4,4'-DDE	0.2		0.14	0.08	yes	8081A	µg/L	x	x	0.10 U	**0.36**			0.0094 U	0.0095 U	no	**0.17**	0.1 U		**0.28 J**	**0.12 J**	yes
4,4'-DDT	0.2		0.0006	0.2	yes	8081A	µg/L	x	x	0.10 U	0.1 U	0.0091UJ	0.0090UJ	0.0094 U	0.0095 U	no	0.10 U	0.1 U	0.0093R	0.0093 UJ	0.0093 UJ	no
Aldrin	0.004	0.05	0.0001	0.05	yes	8081A	µg/L	x	x	0.050 U	0.07 U			0.0066 U	0.0067 U	no	0.050 U	0.07 U		0.0065 UJ	0.0065 UJ	no
alpha-BHC	0.011	0.05	0.34	0.05	yes	8081A	µg/L	x	x	0.050 U	0.057 U			0.0053 U	0.0054 U	no	0.050 U	0.057 U		0.0053 UJ	0.0053 UJ	no
beta-BHC	0.037	0.05	0.046	0.05	yes	8081A	µg/L	x	x	0.050 U	0.067 U	0.0063UJ	0.0063 UJ	0.0063 U	0.0064 U	no	0.050 U	0.067 U	0.0064R	0.0063 UJ	0.0063 UJ	no
Chlordane (technical)	0.052		0.052	0.8	yes	8081A	µg/L	x	x	0.50 U	1.3 U			0.12 U	0.12 U	no	0.50 U	1.3 U		0.12 UJ	0.12 UJ	no
delta-BHC			0.34		no	8081A	µg/L	x	x	0.050 U	0.05 U					no	0.050 U	0.05 U				no
Dieldrin	0.0042	0.1	0.0001	0.1	yes	8081A	µg/L	x	x	0.10 U	0.1 U			0.0094 U	0.0095 U	no	0.10 U	0.1 U		0.0093 UJ	0.0093 UJ	no
Endosulfan I	220		0.0087	0.1	yes	8081A	µg/L	x	x	0.050 U	0.05 U			0.0047 U	0.0048 U	no	0.050 U	0.05 U		0.0047 UJ	0.0047 UJ	no
Endosulfan II	220		0.0087	0.1	yes	8081A	µg/L	x	x	0.10 U	0.1 U			0.0094 U	0.0095 U	no	0.10 U	0.1 U		0.0093 UJ	0.0093 UJ	no
Endosulfan sulfate			0.1	0.1	no	8081A	µg/L	x	x	0.10 UJ	0.1 U					no	0.10 UJ	0.1 U				no
Endrin	2		0.0023	0.2	yes	8081A	µg/L	x	x	0.10 U	0.1 U			0.0094 U	0.0095 U	no	0.10 U	0.1 U		0.0093 UJ	0.0093 UJ	no
Endrin aldehyde					no	8081A	µg/L	x	x	0.10 U	0.16 U					no	0.10 U	0.16 U				no
Endrin ketone					no	8081A	µg/L	x		0.10 UJ	0.1 U					no	0.10 UJ	0.1 U				no
gamma-BHC (Lindane)	0.2		0.063	0.1	no	8081A	µg/L	x	x	0.050 U	0.059 U					no	0.050 U	0.059 U				no
Heptachlor	0.4		0.0002	0.05	yes	8081A	µg/L	x	x	0.050 U	0.07 U			0.0066 U	0.0067 U	no	0.050 U	0.07 U		0.0065 UJ	0.0065 UJ	no
Heptachlor epoxide	0.2		0.0036	0.08	yes	8081A	µg/L	x	x	0.050 U	0.06 U			0.0056 U	0.0057 U	no	0.050 U	0.06 U		0.0056 UJ	0.0056 UJ	no
Methoxychlor	40		0.03	0.2	yes	8081A	µg/L	x	x	0.50 U	0.13 U			0.012 UJ	0.012 U	no	0.50 U	0.13 U		0.012 UJ	0.012 UJ	no
Toxaphene	3		0.0002	3	yes	8081A	µg/L	x	x	1.0 U	5 U			0.47 U	0.48 U	no	1.0 U	5 U		0.47 UJ	0.47 UJ	no

Pesticides/PCBs	Action Level (Ground-water)	PQL (Ground-water)	Action Level (Surface Water)	PQL (Surface Water)	Retained for PMP Mod Nov-12	Method	Units	App B	App IX	Location							Retained for PMP Modification Apr-14
										S2MW-07							
										Date Collected						Jan-14	
										Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Dec-13 DUP	Retain	
4,4'-DDD	0.28		0.0064	0.08	yes	8081A	µg/L	x	x	**0.056 J**	**0.08**	0.0061UJ	**0.041 J**	0.017 U	**0.015 J**	yes	yes
4,4'-DDE	0.2		0.14	0.08	yes	8081A	µg/L	x	x	0.10 U	0.1 U		**0.039 J**	0.033 U	0.033 U	no	yes
4,4'-DDT	0.2		0.0006	0.2	yes	8081A	µg/L	x	x	0.10 U	0.1 U	0.0092UJ	0.0094 UJ	0.0094 U	0.0094 U	no	no
Aldrin	0.004	0.05	0.0001	0.05	yes	8081A	µg/L	x	x	0.050 U	0.07 U		0.0066 U	0.0066 U	0.0066 U	no	no
alpha-BHC	0.011	0.05	0.34	0.05	yes	8081A	µg/L	x	x	0.050 U	0.057 U		0.0053 U	0.0053 U	0.0053 U	no	no
beta-BHC	0.037	0.05	0.046	0.05	yes	8081A	µg/L	x	x	0.050 U	0.067 U	0.0063UJ	0.0063 U	0.0063 U	0.0063 U	no	no
Chlordane (technical)	0.052		0.052	0.8	yes	8081A	µg/L	x	x	0.50 U	1.3 U		0.12 U	0.12 U	0.12 U	no	no
delta-BHC			0.34		no	8081A	µg/L	x	x	0.050 U	0.05 U					no	no
Dieldrin	0.0042	0.1	0.0001	0.1	yes	8081A	µg/L	x	x	0.10 U	0.1 U		0.0094 U	0.0094 U	0.0094 U	no	no
Endosulfan I	220		0.0087	0.1	yes	8081A	µg/L	x	x	0.050 U	0.05 U		0.0047 U	0.0047 U	0.0047 U	no	no
Endosulfan II	220		0.0087	0.1	yes	8081A	µg/L	x	x	0.10 U	0.1 U		0.0094 U	0.0094 U	0.0094 U	no	no
Endosulfan sulfate			0.1	0.1	no	8081A	µg/L	x	x	0.10 UJ	0.1 U					no	no
Endrin	2		0.0023	0.2	yes	8081A	µg/L	x	x	0.10 U	0.1 U		0.0094 U	0.0094 U	0.0094 U	no	no
Endrin aldehyde					no	8081A	µg/L	x	x	0.10 U	0.16 U					no	no
Endrin ketone					no	8081A	µg/L	x		0.10 UJ	0.1 U					no	no
gamma-BHC (Lindane)	0.2		0.063	0.1	no	8081A	µg/L	x	x	0.050 U	0.059 U					no	no
Heptachlor	0.4		0.0002	0.05	yes	8081A	µg/L	x	x	0.050 U	0.07 U		0.0066 U	0.0066 U	0.0066 U	no	no
Heptachlor epoxide	0.2		0.0036	0.08	yes	8081A	µg/L	x	x	0.050 U	0.06 U		0.0056 U	0.0056 U	0.0057 U	no	no
Methoxychlor	40		0.03	0.2	yes	8081A	µg/L	x	x	0.50 U	0.13 U		0.012 UJ	0.012 U	0.012 U	no	no
Toxaphene	3		0.0002	3	yes	8081A	µg/L	x	x	1.0 U	5 U		0.47 U	0.47 U	0.47 U	no	no

Not an Appendix IX Compound
PQL listed in 62-777 FAC PQL Table C (Groundwater)
Detected below lowest Action level
Reporting limit above Action level
Reporting limit above Action level but below PQL
Detected above Surface Water Action level
Detected above Groundwater Action level
Compound retained during optimization analysis
No Available Data

Action Level and Appendix B (App B) Compounds (B&RE, 1998)
Appendix IX (App IX) Compounds from 40CFR Part 264 Appendix IX

Qualifiers:
U - Non-detect, Reporting limit estimated.
UJ - Non-detect, Reporting limit listed.
R - Analyte result is rejected.

Table 17. SWMU-2 Surface Water Metals

Inorganics	Action Level (Surface Water)	PQL (Surface Water)	Retained for PMP Mod Nov-12	Method	Units	App B	TAL	Location																			
								S2SW-01							S2SW-02							S2SW-03					
								Date Collected						Jan-14	Date Collected						Jan-14	Date Collected					Jan-14
								Jan-03	Oct-10	Dec-11	Dec-11 Dup	Dec-12	Dec-13	Dec-13 DUP	Retain	Jan-03	Oct-10	Dec-11	Dec-11 Dup	Dec-12	Dec-13	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain
Aluminum	1,500		no	6010B	µg/L	x	x		100 U	500U	500U				no	19.6 U	**210**	500 U	500 U			no	137 U	100 U	500 U			no
Antimony	4,300		no	6010B	µg/L	x	x		10 U	20U	20U				no	3.6 U	10 U	20 U	20 U			no	3.6 U	10 U	20 U			no
Arsenic	50		no	6010B	µg/L	x	x		8.0 U	13U	13U				no	4.7 U	8.0 U	13 U	13 U			no	4.7 U	8.0 U	13 U			no
Barium	10,000		no	6010B	µg/L	x	x		**19**						no	**12.7**	**20**					no	**13.3**	**20**				no
Beryllium	0.28		yes	6010B	µg/L	x	x		0.20 U	1.5U	1.5U	0.25 U	0.25 U	0.25 U	no	0.36 U	0.20 U	1.5 U	1.5 U	0.25 U	0.25 U	no	0.36 U	0.20 U	1.5 U	0.25 U	0.25 U	no
Cadmium	9.3		no	6010B	µg/L	x	x		2.0 U						no	0.57 U	2.0 U					no	0.45 U	2.0 U				no
Calcium			no	6010B	µg/L	x	x		**240,000**						no	**198,000**	**260,000**					no	**178,000**	**280,000**				no
Chromium	50		no	6010B	µg/L	x	x		2.0 U	25U	25U				no	1.3 U	2.0 U	25 U	25 U			no	1.3 U	2.0 U	25 U			no
Cobalt	35,000		no	6010B	µg/L	x	x		2.0 U						no	1.7 U	2.0 U					no	1.7 U	2.0 U				no
Copper	2.9		yes	6010B	µg/L	x	x		**3.3 J**			1.1 U	1.1 U	1.1 U	no	3.4 U	2.0 U			**1.3 J**	1.1 U	no	3.4 U	2.0 U		1.1 U	**0.29 J**	no
Iron	300		yes	6010B	µg/L	x	x		**120**			44 U	44 U	44 U	no	31.0 U	50 U			44 U	44 U	no	**165**	**440**		**58 J**	**51 J**	no
Lead	5.6		no	6010B	µg/L	x	x		4.0 U	5.0U	5.0U				no	2.6 U	4.0 U	5.0 U	5.0 U			no	2.6 U	4.0 U	5.0 U			no
Magnesium			no	6010B	µg/L	x	x		**700,000 D**						no	**553,000**	**720,000 D**					no	**483,000**	**770,000 D**				no
Manganese	10		no	6010B	µg/L	x	x		2.0 U						no	1.7 U	2.0 U					no	**3**	2.0 U				no
Mercury	1.26		no	7470A	µg/L	x	x		0.10 U						no	0.03 U	0.10 U					no	0.04 U	0.10 U				no
Nickel	8.3		no	6010B	µg/L	x	x		4.0 U						no	1.9 U	4.0 U					no	1.9 U	4.0 U				no
Potassium			no	6010B	µg/L	x	x		**230,000 D**						no	**153,000**	**240,000 D**					no	**146,000**	**260,000 D**				no
Selenium	71		no	6010B	µg/L	x	x		8.0 U						no	6.4 U	8.0 U					no	6.4 U	8.0 U				no
Silver	2.3		no	6010B	µg/L	x	x		1.6 U	1.8U	1.8U				no	1.5 U	1.6 U	1.8 U	1.8 U			no	1.5 U	1.6 U	1.8 U			no
Sodium			no	6010B	µg/L	x	x		**6,900,000 D**						no	**4,180,000**	**7,000,000 D**					no	**3,750,000**	**7,600,000 D**				no
Thallium	7.3		yes	6020	µg/L	x	x		0.25 U			0.25 U	0.25 U	0.25 U	no	10.0 U	0.25 U			0.25 U	0.25 U	no	8.8 U	0.25 U		0.25 U	0.25 U	no
Tin	0.01		yes	6010B	µg/L	x				14U	14U	1.4 U	1.4 U	1.4 U	yes	6.0 U		14 U	14 U	**1.4 J**	1.4 U	yes	6 U		14 U	1.4 U	1.4 U	yes
Vanadium	10,000		no	6010B	µg/L	x	x		2.4 U						no	2.4 U	2.4 U					no	1.4 U	2.4 U				no
Zinc	86		no	6010B	µg/L	x	x		**13 J**						no	**11.6**	10 U					no	**13.4**	**12 J**				no

Inorganics	Action Level (Surface Water)	PQL (Surface Water)	Retained for PMP Mod Nov-12	Method	Units	App B	TAL	Location														Retained for PMP Modification Apr-14
								S2SW-04						S2SW-05								
								Date Collected					Jan-14	Date Collected						Jan-14		
								Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain			
Aluminum	1,500		no	6010B	µg/L	x	x	19.3 U	100 U	500U			no	31.2 U	100 U	500U			no			no
Antimony	4,300		no	6010B	µg/L	x	x	3.6 U	10 U	20U			no	3.6 U	10 U	20U			no			no
Arsenic	50		no	6010B	µg/L	x	x	4.7 U	**5.4 J**	13U			no	4.7 U	**7.8 J**	13U			no			no
Barium	10,000		no	6010B	µg/L	x	x	**12.1**	**18**				no	**13.1**	**19**				no			no
Beryllium	0.28		yes	6010B	µg/L	x	x	0.36 U	0.20 U	1.5U	0.25 U	0.25 U	no	0.36 U	0.20 U	1.5U	0.25 U	0.25 U	no			no
Cadmium	9.3		no	6010B	µg/L	x	x	0.45 U	2.0 U				no	0.45 U	2.0 U				no			no
Calcium			no	6010B	µg/L	x	x	**165,000**	**310,000**				no	**156,000**	**240,000**				no			no
Chromium	50		no	6010B	µg/L	x	x	1.3 U	2.0 U	25U			no	1.3 U	2.0 U	25U			no			no
Cobalt	35,000		no	6010B	µg/L	x	x	1.7 U	2.0 U				no	1.7 U	2.0 U				no			no
Copper	2.9		yes	6010B	µg/L	x	x	3.4 U	2.0 U		1.1 U	1.1 U	no	3.4 U	2.0 U		**1.2 J**	1.1 U	no			no
Iron	300		yes	6010B	µg/L	x	x	37.4 U	**50 J**		**190**	44 U	no	29.5 U	**68 J**		44 U	44 U	no			no
Lead	5.6		no	6010B	µg/L	x	x	2.6 U	4.0 U	5.0U			no	2.6 U	4.0 U	5.0U			no			no
Magnesium			no	6010B	µg/L	x	x	**471,000**	**830,000 D**				no	**450,000**	**700,000 D**				no			no
Manganese	10		no	6010B	µg/L	x	x	1.6 U	2.0 U				no	1.1 U	2.0 U				no			no
Mercury	1.26		no	7470A	µg/L	x	x	0.06 U	0.10 U				no	0.07 U	0.10 U				no			no
Nickel	8.3		no	6010B	µg/L	x	x	1.9 U	4.0 U				no	1.9 U	4.0 U				no			no
Potassium			no	6010B	µg/L	x	x	**145,000**	**280,000 D**				no	**133,000**	**240,000 D**				no			no
Selenium	71		no	6010B	µg/L	x	x	6.4 U	8.0 U				no	6.4 U	8.0 U				no			no
Silver	2.3		no	6010B	µg/L	x	x	1.5 U	1.6 U	1.8U			no	1.5 U	1.6 U	1.8U			no			no
Sodium			no	6010B	µg/L	x	x	**3,600,000**	**8,200,000 D**				no	**3,400,000**	**6,700,000 D**				no			no
Thallium	7.3		yes	6020	µg/L	x	x	8.6 U	0.25 U		0.25 U	0.25 U	no	8.6 U	0.25 U		0.25 U	0.25 U	no			no
Tin	0.01		yes	6010B	µg/L	x		6 U		14U	**2.0 J**	1.4 U	yes	6 U		14U	**1.4 J**	1.4 U	yes			yes
Vanadium	10,000		no	6010B	µg/L	x	x	1 U	2.4 U				no	1 U	2.4 U				no			no
Zinc	86		no	6010B	µg/L	x	x	**9.4**	10 U				no	**6.6**	10 U				no			no

Not a Target Analyte List (TAL) Metal
Detected below Action level
Reporting limit above Action level
Detected above Action level
Compound retained during optimization analysis
No Available Data

Action Level and Appendix B (App B) Compounds (B&RE, 1998)
Target Analyte List (TAL) Compounds (B&RE, 1998)

Qualifiers:
D - Dilution Result.
J - Estimated concentration.
U - Non-detect, Reporting limit estimated.

Table 18. SWMU-2 Surface Water Pesticides

Pesticides	Action Level (Surface Water)	PQL (Surface Water)	Retained for PMP Mod Nov-12	Method	Units	App B	App IX	Location: S2SW-01 Date Collected Jan-03	Oct-10	Dec-11	Dec-11 Dup	Dec-12	Dec-13	Dec-13 DUP	Jan-14 Retain	S2SW-02 Date Collected Jan-03	Oct-10	Dec-11	Dec-11 Dup	Dec-12	Dec-13	Jan-14 Retain
4,4'-DDD	0.0064	0.08	yes	8081A	µg/L	x	x	**0.066 J**	0.1 U	0.0061UJ	0.0065UJ	0.0094 UJ	0.0094 U	0.0094 U	no	**0.057 J**	0.1 U	0.0061UJ	0.0063UJ	0.0098 UJ	0.0095 U	no
4,4'-DDE	0.14	0.08	no	8081A	µg/L	x	x	0.10 U	0.1 U	0.0073UJ	0.0074UJ				no	0.10 U	0.1 U	0.0073UJ	0.0074UJ			no
4,4'-DDT	0.00059	0.2	yes	8081A	µg/L	x	x	0.10 U	0.1 U	0.0092UJ	0.0093UJ	0.0094 UJ	0.0094 U	0.0094 U	no	0.10 U	0.1 U	0.0092UJ	0.0093UJ	0.0098 U	0.0095 U	no
Aldrin	0.00014	0.05	yes	8081A	µg/L	x	x	0.050 U	0.07 U	0.0066UJ	0.0067UJ	0.0066 UJ	0.0066 U	0.0066 U	no	0.050 U	0.07 U	0.0066UJ	0.0067UJ	0.0069 U	0.0066 U	no
alpha-BHC	0.34	0.05	no	8081A	µg/L	x	x	0.050 U	0.057 U						no	0.050 U	0.057 U					no
beta-BHC	0.046	0.05	yes	8081A	µg/L	x	x	0.050 U	0.067 U	0.0063UJ	0.0065UJ	0.0063 UJ	0.0063 U	0.0063 U	no	0.050 U	0.067 U	0.0063UJ	0.0065UJ	0.0066 U	0.0063 U	no
Chlordane (technical)	0.052	0.8	yes	8081A	µg/L	x	x	0.50 U	1.3 U			0.12 UJ	0.12 U	0.12 U	no	0.50 U	1.3 U			0.13 U	0.12 U	no
delta-BHC	0.34		no	8081A	µg/L	x	x	0.050 U	0.05 U						no	0.050 U	0.05 U					no
Dieldrin	0.00014	0.1	yes	8081A	µg/L	x	x	0.10 U	0.1 U			0.0094 UJ	0.0094 U	0.0094 U	no	0.10 U	0.1 U			0.0098 U	0.0095 U	no
Endosulfan I	0.0087	0.1	yes	8081A	µg/L	x	x	0.050 U	0.05 U			0.0047 UJ	0.0047 U	0.0047 U	no	0.050 U	0.05 U			0.0049 U	0.0047 U	no
Endosulfan II	0.0087	0.1	yes	8081A	µg/L	x	x	0.10 U	0.1 U			0.0094 UJ	0.0094 U	0.0094 U	no	0.10 U	0.1 U			0.0098 U	0.0095 U	no
Endosulfan sulfate	0.1	0.1	no	8081A	µg/L	x	x	0.10 UJ	0.1 U						no	0.10 UJ	0.1 U					no
Endrin	0.0023	0.2	yes	8081A	µg/L	x	x	0.10 U	0.1 U			0.0094 UJ	0.0094 U	0.0094 U	no	0.10 U	0.1 U			0.0098 U	0.0095 U	no
Endrin aldehyde			no	8081A	µg/L	x	x	0.10 U	0.16 U						no	0.10 U	0.16 U					no
Endrin ketone			no	8081A	µg/L	x		0.10 UJ	0.1 U						no	0.10 UJ	0.1 U					no
gamma-BHC (Lindane)	0.063	0.1	no	8081A	µg/L	x	x	0.050 U	0.059 U						no	0.050 U	0.059 U					no
Heptachlor	0.00021	0.05	yes	8081A	µg/L	x	x	0.050 U	0.07 U	0.0066UJ	0.0067UJ	0.0066 UJ	0.0066 U	0.0066 U	no	0.050 U	0.07 U	0.0066UJ	0.0067UJ	0.0069 UJ	0.0066 U	no
Heptachlor epoxide	0.0036	0.08	yes	8081A	µg/L	x	x	0.050 U	0.06 U			0.0056 UJ	0.0057 U	0.0056 U	no	0.050 U	0.06 U			0.0059 U	0.0057 U	no
Methoxychlor	0.03	0.2	yes	8081A	µg/L	x	x	0.50 U	0.13 U			0.012 UJ	0.012 U	0.012 U	no	0.50 U	0.13 U			0.013 U	0.012 U	no
Toxaphene	0.0002	3	yes	8081A	µg/L	x	x	1.0 U	5 U			0.47 UJ	0.47 U	0.47 U	no	1.0 U	5 U			0.49 U	0.47 U	no

Pesticides	Action Level (Surface Water)	PQL (Surface Water)	Retained for PMP Mod Nov-12	Method	Units	App B	App IX	Location: S2SW-03 Date Collected Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Jan-14 Retain	S2SW-04 Date Collected Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Jan-14 Retain	S2SW-05 Date Collected Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Jan-14 Retain	Retained for PMP Modification Apr-14
4,4'-DDD	0.0064	0.08	yes	8081A	µg/L	x	x	**0.046 J**	0.1 U	0.0063UJ	0.0094 UJ	0.0099 UJ	no	0.10 U	0.1 U	0.0062UJ	0.0094 UJ	0.0094 UJ	no	0.10 U	0.1 U	0.0062UJ	0.0094 U	0.0094 U	no	no
4,4'-DDE	0.14	0.08	no	8081A	µg/L	x	x	0.10 U	0.1 U	0.0074UJ			no	0.10 U	0.1 U	0.0073UJ			no	0.10 U	0.1 U	0.0074UJ			no	no
4,4'-DDT	0.00059	0.2	yes	8081A	µg/L	x	x	0.10 U	0.1 U	0.0094UJ	0.0094 UJ	**0.018 J**	yes	0.10 U	0.1 U	0.0092UJ	0.0094 UJ	0.0094 UJ	no	0.10 U	0.1 U	0.0093UJ	0.0094 UJ	0.0094 U	no	yes
Aldrin	0.00014	0.05	yes	8081A	µg/L	x	x	0.050 U	0.07 U	0.0068UJ	0.0066 UJ	0.0069 UJ	no	0.050 U	0.07 U	0.0066UJ	0.0066 UJ	0.0066 UJ	no	0.050 U	0.07 U	0.0067UJ	0.0066 U	0.0066 U	no	no
alpha-BHC	0.34	0.05	no	8081A	µg/L	x	x	0.050 U	0.057 U				no	0.050 U	0.057 U				no	0.050 U	0.057 U				no	no
beta-BHC	0.046	0.05	yes	8081A	µg/L	x	x	0.050 U	0.067 U	0.0065UJ	0.0063 UJ	0.0066 UJ	no	0.050 U	0.067 U	0.0064U	0.0063 UJ	0.0063 UJ	no	0.050 U	0.067 U	0.0064UJ	0.0063 U	0.0063 U	no	no
Chlordane (technical)	0.052	0.8	yes	8081A	µg/L	x	x	0.50 U	1.3 U		0.12 UJ	0.13 UJ	no	0.50 U	1.3 U		0.12 UJ	0.12 UJ	no	0.50 U	1.3 U		0.12 U	0.12 U	no	no
delta-BHC	0.34		no	8081A	µg/L	x	x	0.050 U	0.05 U				no	0.050 U	0.05 U				no	0.050 U	0.05 U				no	no
Dieldrin	0.00014	0.1	yes	8081A	µg/L	x	x	0.10 U	0.1 U		0.0094 UJ	0.0099 UJ	no	0.10 U	0.1 U		0.0094 UJ	0.0094 UJ	no	0.10 U	0.1 U		0.0094 U	0.0094 U	no	no
Endosulfan I	0.0087	0.1	yes	8081A	µg/L	x	x	0.050 U	0.05 U		0.0047 UJ	0.005 UJ	no	0.050 U	0.05 U		0.0047 UJ	0.0047 UJ	no	0.050 U	0.05 U		0.0047 U	0.0047 U	no	no
Endosulfan II	0.0087	0.1	yes	8081A	µg/L	x	x	0.10 U	0.1 U		0.0094 UJ	0.0099 UJ	no	0.10 U	0.1 U		0.0094 UJ	0.0094 UJ	no	0.10 U	0.1 U		0.0094 U	0.0094 U	no	no
Endosulfan sulfate	0.1	0.1	no	8081A	µg/L	x	x	0.10 UJ	0.1 U				no	0.10 UJ	0.1 U				no	0.10 UJ	0.1 U				no	no
Endrin	0.0023	0.2	yes	8081A	µg/L	x	x	0.10 U	0.1 U		0.0094 UJ	0.0099 UJ	no	0.10 U	0.1 U		0.0094 UJ	0.0094 UJ	no	0.10 U	0.1 U		0.0094 U	0.0094 U	no	no
Endrin aldehyde			no	8081A	µg/L	x	x	0.10 U	0.16 U				no	0.10 U	0.16 U				no	0.10 U	0.16 U				no	no
Endrin ketone			no	8081A	µg/L	x		0.10 UJ	0.1 U				no	0.10 UJ	0.1 U				no	0.10 UJ	0.1 U				no	no
gamma-BHC (Lindane)	0.063	0.1	no	8081A	µg/L	x	x	0.050 U	0.059 U				no	0.050 U	0.059 U				no	0.050 U	0.059 U				no	no
Heptachlor	0.00021	0.05	yes	8081A	µg/L	x	x	0.050 U	0.07 U	0.0068UJ	0.0066 UJ	0.0069 UJ	no	0.050 U	0.07 U	0.0066UJ	0.0066 UJ	0.0066 UJ	no	0.050 U	0.07 U	0.0067UJ	0.0066 U	0.0066 U	no	no
Heptachlor epoxide	0.0036	0.08	yes	8081A	µg/L	x	x	0.050 U	0.06 U		0.0056 UJ	0.006 UJ	no	0.050 U	0.06 U		0.0056 UJ	0.0057 UJ	no	0.050 U	0.06 U		0.0057 U	0.0057 U	no	no
Methoxychlor	0.03	0.2	yes	8081A	µg/L	x	x	0.50 U	0.13 U		0.012 UJ	0.013 UJ	no	0.50 U	0.13 U		0.012 UJ	0.012 UJ	no	0.50 U	0.13 U		0.012 UJ	0.012 U	no	no
Toxaphene	0.0002	3	yes	8081A	µg/L	x	x	1.0 U	5 U		0.47 UJ	0.5 UJ	no	1.0 U	5 U		0.47 UJ	0.47 UJ	no	1.0 U	5 U		0.47 U	0.47 U	no	no

Not an Appendix IX Compound
PQL listed in 62-777 FAC PQL Table E (Marine Surface Water)
Detected below Action level
Reporting limit above Action level
Reporting limit above Action level but below PQL
Detected above Action level
Compound retained during optimization analysis
No Available Data
Action Level and Appendix B (App B) Compounds (B&RE, 1998)

Appendix IX (App IX) Compounds from 40CFR Part 264 Appendix IX
Qualifiers:
U - Non-detect, Reporting limit estimated.
UJ - Non-detect, Reporting limit listed.

Table 19. SWMU-2 Sediment Metals

Inorganics	Action Level (Sediment)	PQL (Sediment)	Retained for PMP Modification Nov-12	Method	Units	App B	TAL	Location																	
								S2SD-01						S2SD-02						S2SD-03					
								Date Collected					Jan-13	Date Collected					Jan-13	Date Collected					Jan-13
								Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain
Aluminum	2,664		yes	6010B	mg/kg	x	x	2,050	2,900	3,000	1,500	1000 J	no	428	120	2,000	680	1400 J	no	5,030 J	2,400	4,900	810	2500 J	no
Antimony	12		no	6010B	mg/kg	x	x	0.22 U	5.9 U				no	0.23 U	1.1 U				no	0.92 U	11 U				no
Arsenic	7.24		yes	6010B	mg/kg	x	x	1 U	8.3 J	3.4	2.0	1.8	no	0.81 U	1.1 J	4.5	1.6	1.9	no	2.5 U	10 J	6.1	0.80 J	3	no
Barium	40		no	6010B	mg/kg	x	x	10.7	14				no	9.4	8.8				no	11.7 J	5.7 J				no
Beryllium	0.1		yes	6010B	mg/kg	x	x	0.15 U	0.24 J	0.27U	0.12 U	0.051 UJ	yes	0.09 U	0.028 U	0.37U	0.071 U	0.058 J	no	0.23 U	0.70 U	0.67U	0.11 U	0.14 UJ	yes
Cadmium	0.676		yes	6010B	mg/kg	x	x	0.94 U	1.7 J		2.0	1.2	yes	0.25 U	0.28 U		0.61	0.52	no	0.82 U	1.8 D		0.46	1.1	yes
Calcium			no	6010B	mg/kg	x	x	451,000	340,000				no	409,000	290,000 D				no	266,000 J	51,000				no
Chromium	52.3		no	6010B	mg/kg	x	x	10.8 J	21	31			no	2.4 J	1.5	15			no	12.6 J	12 J	16			no
Cobalt	0.48		yes	6010B	mg/kg	x	x	0.34	1.7 J		1.1	1.1 J	yes	0.12	0.18 J		0.76	0.96 J	yes	0.8 J	3.1 J		0.29	1.3 J	yes
Copper	18.7		yes	6010B	mg/kg	x	x	12.5 J	82		30	18 J	yes	3.8 J	1.8 J		13	13 J	no	20.8 J	44		9.1	29 J	yes
Iron	2,398		yes	6010B	mg/kg	x	x	2,410 J	4,400	4,600	2,400	1600 J	yes	294 J	110	3,000	1,200	1300 J	no	2,670 J	5,000	4,400	750	2300 J	no
Lead	34.18		yes	6010B	mg/kg	x	x	24.1	83		54 UJ	39 J	yes	4.3	0.75 U		20 UJ	13 J	no	23.3 J	27		11 UJ	27 J	no
Magnesium			no	6010B	mg/kg	x	x	2,680	12,000				no	1,910	1,200				no	5,140 J	18,000				no
Manganese	460		no	6010B	mg/kg	x	x	14.8 J	27				no	4.3 J	4.0				no	21.7 J	18				no
Mercury	0.13	0.02	yes	7471A	mg/kg	x	x	0.06	0.07		0.16	0.053	yes	0.02	0.013 U		0.036 J	0.028	no	0.1 J	0.18 J		0.21	0.11 J	yes
Nickel	15.9		no	6010B	mg/kg	x	x	2.9 J	8.6				no	0.82 J	0.58 U				no	6 J	5.3				no
Potassium			no	6010B	mg/kg	x	x	749	2,800				no	194 U	800				no	1,140 J	5,000				no
Selenium	1.42		yes	6010B	mg/kg	x	x	0.39 U	3.7 U		1.2 U	0.51 U	no	0.41 U	1.4 U		0.71 U	0.39 U	no	1.6 J	7.0 U		1.1 U	1.4 U	no
Silver	0.733		yes	6010B	mg/kg	x	x	0.46 U	1.2 U	0.54U	0.24 U	0.11 J	no	0.24 U	0.23 U	0.74U	0.14 U	0.079 U	no	0.77 UJ	2.2 U	1.3U	0.22 U	0.28 U	no
Sodium			no	6010B	mg/kg	x	x	7,580	53,000 D				no	3,410	6,500				no	19,400 J	110,000 D				no
Thallium			no	6010B	mg/kg	x	x	0.53 U	15 U				no	0.55 U	2.8 U				no	0.89 UJ	28 U				no
Tin	1.98		yes	6010B	mg/kg	x		4.3 U		28U	12 U	5.3 U	yes	2 U		38U	7.2 U	4.1 U	yes	6.9 U		69U	11 U	15 U	yes
Vanadium	10.44		yes	6010B	mg/kg	x	x	6.8	19		7.9	5.6 J	no	2.1	0.76 J		4.4	5 J	no	13.7 J	21		3.7	9.9 J	no
Zinc	124		yes	6010B	mg/kg	x	x	41	190		93 J	63 J	no	5.6	3.9		32 J	23 J	no	64.7 J	150		23 J	80 J	no

Inorganics	Action Level (Sediment)	PQL (Sediment)	Retained for PMP Modification Nov-12	Method	Units	App B	TAL	Location												Retained for PMP Modification Apr-14
								S2SD-04						S2SD-05						
								Date Collected					Jan-13	Date Collected					Jan-13	
								Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	
Aluminum	2,664		yes	6010B	mg/kg	x	x	2,310 J	3,000	1,300	860	580 J	no	2,940	99	450	50	310 J	no	no
Antimony	12		no	6010B	mg/kg	x	x	0.9 U	4.7 U				no	1.1 U	1.1 U				no	no
Arsenic	7.24		yes	6010B	mg/kg	x	x	2.2 U	8.0 J	2	1.5	1.5	no	2.5 J	1.1 U	2.5	0.55	2.3	no	no
Barium	40		no	6010B	mg/kg	x	x	9 J	12				no	9.3	9.0				no	no
Beryllium	0.1		yes	6010B	mg/kg	x	x	0.13 UJ	0.14 J	0.26U	0.057 U	0.036 UJ	no	0.05 U	0.028 U	0.12U	0.045 U	0.043 UJ	no	yes
Cadmium	0.676		yes	6010B	mg/kg	x	x	3.8 U	1.2 J		0.96	0.24	yes	3.4	0.28 U		0.095	0.29	no	yes
Calcium			no	6010B	mg/kg	x	x	233,000 J	68,000				no	263,000	440,000 D				no	no
Chromium	52.3		no	6010B	mg/kg	x	x	15.8 J	13	9.7			no	13.6 J	1.6	5.1			no	no
Cobalt	0.48		yes	6010B	mg/kg	x	x	0.91 J	0.92 J		0.64	1.1 J	yes	0.54	0.28 U		0.17	1.8 J	yes	yes
Copper	18.7		yes	6010B	mg/kg	x	x	40.7 J	71		19	5.4 J	yes	24.6 J	3.9		1.9	11 J	no	yes
Iron	2,398		yes	6010B	mg/kg	x	x	3,830 J	4,000	2,300	1,800	580 J	no	3,150 J	560	4,300	540	4200 J	yes	yes
Lead	34.18		yes	6010B	mg/kg	x	x	78.5 J	48		34 UJ	6.1 J	no	39.1	4.0		1.6 UJ	16 J	no	yes
Magnesium			no	6010B	mg/kg	x	x	5,780 J	16,000				no	7,920	1,300				no	no
Manganese	460		no	6010B	mg/kg	x	x	24.7 J	12				no	54.9 J	5.9				no	no
Mercury	0.13	0.02	yes	7471A	mg/kg	x	x	0.18 J	0.77		0.064	0.022 J	no	0.09	0.012 U		0.032 J	0.02 J	no	yes
Nickel	15.9		no	6010B	mg/kg	x	x	5.9 J	6.6 J				no	4.8 J	1.2 J				no	no
Potassium			no	6010B	mg/kg	x	x	1,520 J	2,900				no	599	430				no	no
Selenium	1.42		yes	6010B	mg/kg	x	x	0.84 UJ	2.9 U		0.57 U	0.36 U	no	0.36 U	1.4 U		0.45 U	0.43 U	no	no
Silver	0.733		yes	6010B	mg/kg	x	x	0.97 UJ	0.93 U	0.51U	0.11 U	0.073 U	no	0.41 U	0.22 U	0.24U	0.090 U	0.086 U	no	no
Sodium			no	6010B	mg/kg	x	x	27,100 J	47,000 D				no	11,900	5,300				no	no
Thallium			no	6010B	mg/kg	x	x	1.1 UJ	12 U				no	0.48 U	2.8 U				no	no
Tin	1.98		yes	6010B	mg/kg	x		9.7 U		26U	5.9 U	3.8	yes	5.4 U		12U	4.6 U	4.5 U	yes	yes
Vanadium	10.44		yes	6010B	mg/kg	x	x	10.6 J	28		4.1	2.5 J	no	9.4	1.4		1.1	5.4 J	no	no
Zinc	124		yes	6010B	mg/kg	x	x	131 J	160		44 J	14 J	no	759	13		29 J	79 J	no	no

Not a Target Analyte List (TAL) Metal
Detected below Action level
Reporting limit above Action level
Detected above Action level
Compound retained during optimization analysis
No Available Data

Action Level and Appendix B (App B) Compounds (B&RE, 1998)
Target Analyte List (TAL) Compounds (B&RE, 1998)

Qualifiers:
D- Dilution Result.
J - Estimated concentration.
U - Non-detect, Reporting limit estimated.
UJ - Non-detect, Reporting limit listed.

Table 20. SWMU-2 Sediment Pesticides

Pesticides/PCBs	Action Level (Sediment)	PQL (Sediment)	Retained for PMP Mod Nov-12	Method	Units	App B	App IX	Location															
								S2SD-01						S2SD-02						S2SD-03					
								Date Collected					Jan-14	Date Collected					Jan-14	Date Collected					Jan-14
								Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain
4,4'-DDD	1.78		yes	8081A	µg/kg	x	x	**5,900**	**400**	**880 D**	**470**	**1,100**	yes	**110,000**	0.51 U	**2,800 D**	**2100 R**	**140**	yes	**46 J**	**65**	**300**	**67 J**	**490**	yes
4,4'-DDE	2.07		yes	8081A	µg/kg	x	x	**740**	**480**	**990 JD**	**690 J**	**1,300 J**	yes	**9,000**	**24**	**840 D**	**570 J**	**620**	yes	**220 J**	**60**	**180**	**240 J**	**600**	yes
4,4'-DDT	1.76		yes	8081A	µg/kg	x	x	**280 J**	2.4 U	**82 JD**	**370 J**	**2,000**	yes	**3,500 J**	**34**	**70 JD**	**1000 J**	**15 J**	yes	**4.8 J**	5.1 U	3.5U	**15 J**	20 U	yes
Aldrin	60		no	8081A	µg/kg	x	x	210 U	3.3 U	27U			no	2,800 U	0.70 U	36U			no	7.4 UJ	7 U	6.8U			no
alpha-BHC	1.05	2	yes	8081A	µg/kg	x	x	210 U	1.3 U		16 U	18 U	yes	2,800 U	0.26 U		9.9 U	6 U	yes	7.4 UJ	2.6 U		3.2 R	11 U	yes
beta-BHC	5	2	yes	8081A	µg/kg	x	x	210 U	2.4 U		31 U	34 U	yes	2,800 U	0.51 U		19 U	12 U	yes	7.4 UJ	5.1 U		6.3 R	20 U	yes
Chlordane (technical)	490		yes	8081A	µg/kg	x	x	210 U	21 U		270 U	300 U	no	2,800 U	4.5 U		170 U	100 U	no	7.4 UJ	45 U		55 R	180 U	no
delta-BHC	3		yes	8081A	µg/kg	x	x	210 U	1.3 U	7.7U	16 U	18 U	yes	2,800 U	0.26 U	10U	9.9 U	6 U	yes	14 UJ	2.6 U	2.0U	3.2 R	11 U	yes
Dieldrin	0.715	3	yes	8081A	µg/kg	x	x	400 U	2.4 U		31 U	34 U	yes	5,400 U	0.51 U		19 U	12 U	yes	14 UJ	5.1 U		6.3 R	20 U	yes
Endosulfan I	2.9	4	yes	8081A	µg/kg	x	x	210 U	1.3 U	8.9U	16 U	18 U	yes	2,800 U	0.26 U	12U	9.9 U	6 U	yes	7.4 UJ	2.6 U	2.3U	3.2 R	11 U	yes
Endosulfan II	14	4	yes	8081A	µg/kg	x	x	400 U	2.4 U		31 U	34 U	yes	5,400 U	0.51 U		19 U	12 U	yes	14 UJ	5.1 U		6.3 R	20 U	yes
Endosulfan sulfate		4	no	8081A	µg/kg	x	x	400 U	2.4 U				no	5,400 U	0.51 U				no	14 UJ	5.1 U				no
Endrin	3.3	5	yes	8081A	µg/kg	x	x	400 U	5.4 U	43U	69 U	76 U	yes	5,400 U	1.1 U	59U	42 U	26 U	yes	14 UJ	11 U	11U	14 R	45 U	yes
Endrin aldehyde	23,000		no	8081A	µg/kg	x	x	400 U	2.5 U				no	5,400 U	0.53 U				no	14 UJ	5.3 U				no
Endrin ketone			no	8081A	µg/kg	x		400 U	2.4 U				no	5,400 UJ	0.51 U				no	14 UJ	5.1 U				no
gamma-BHC (Lindane)	1.22		yes	8081A	µg/kg	x	x	210 U	1.3 U		16 U	18 U	yes	2,800 U	0.26 U		9.9 U	6 U	yes	7.4 UJ	2.6 U		3.2 R	11 U	yes
Heptachlor	4.9		yes	8081A	µg/kg	x	x	210 U	1.3 U		16 U	18 U	yes	2,800 U	0.26 U		9.9 U	6 U	yes	7.4 UJ	2.6 U		3.2 R	11 U	yes
Heptachlor epoxide	300	2	yes	8081A	µg/kg	x	x	210 U	1.3 U		16 U	18 U	no	2,800 U	0.26 U		9.9 U	6 U	no	7.4 UJ	2.6 U		3.2 R	11 U	no
Methoxychlor	19		yes	8081A	µg/kg	x	x	2,100 U	2.6 U		33 U	37 U	yes	28,000 U	0.54 U		20 U	12 U	yes	74 UJ	5.5 U		6.7 R	22 U	yes
Toxaphene	28	100	yes	8081A	µg/kg	x	x	4,000 U	440 U		5,700 U	6,300 U	yes	54,000 U	93 U		3,500 U	2,100 U	yes	140 UJ	930 U		1100 R	3,700 U	yes

Pesticides/PCBs	Action Level (Sediment)	PQL (Sediment)	Retained for PMP Mod Nov-12	Method	Units	App B	App IX	Location												Retained for PMP Modification Apr-14
								S2SD-04						S2SD-05						
								Date Collected					Jan-14	Date Collected					Jan-14	
								Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	
4,4'-DDD	1.78		yes	8081A	µg/kg	x	x	**860 J**	**14**	**180**	170 R	**190**	yes	**120**	**6.6**	**4.4 J**	**3.3 J**	5.9 U	yes	yes
4,4'-DDE	2.07		yes	8081A	µg/kg	x	x	**1100 J**	**47**	**340**	640 R	**120**	yes	**480**	**9.9**	**30**	**19 J**	**18 J**	yes	yes
4,4'-DDT	1.76		yes	8081A	µg/kg	x	x	**61 J**	1.9 U	**16 J**	51 R	5.5 U	yes	**25 J**	**1.4**	**2.8 J**	0.66 UJ	5.9 U	yes	yes
Aldrin	60		no	8081A	µg/kg	x	x	41 UJ	2.6 U	4.8U			no	23 U	0.65 U	1.1U			no	no
alpha-BHC	1.05	2	yes	8081A	µg/kg	x	x	41 UJ	0.98 U		3.9 U	2.8 U	yes	23 U	0.24 U		0.34 UJ	3 U	yes	yes
beta-BHC	5	2	yes	8081A	µg/kg	x	x	41 UJ	1.9 U		7.7 U	5.5 U	yes	23 U	0.48 U		0.66 UJ	5.9 U	yes	yes
Chlordane (technical)	490		yes	8081A	µg/kg	x	x	41 UJ	17 U		67 U	48 UJ	no	23 U	4.2 U		5.8 UJ	52 U	no	no
delta-BHC	3		yes	8081A	µg/kg	x	x	41 UJ	0.98 U	1.4U	3.9 U	2.8 U	yes	23 U	0.24 U	0.33U	0.34 UJ	3 U	no	yes
Dieldrin	0.715	3	yes	8081A	µg/kg	x	x	79 UJ	1.9 U		7.7 U	5.5 U	yes	44 U	0.48 U		0.66 UJ	5.9 U	yes	yes
Endosulfan I	2.9	4	yes	8081A	µg/kg	x	x	41 UJ	0.98 U	1.6U	3.9 U	2.8 U	yes	23 U	0.24 U	0.38U	0.34 UJ	3 U	yes	yes
Endosulfan II	14	4	yes	8081A	µg/kg	x	x	79 UJ	1.9 U		7.7 U	5.5 U	no	**9.0 J**	0.48 U		0.66 UJ	5.9 U	no	yes
Endosulfan sulfate		4	no	8081A	µg/kg	x	x	79 UJ	**1.5 J**				no	44 U	0.48 U				no	no
Endrin	3.3	5	yes	8081A	µg/kg	x	x	79 UJ	4.2 U	7.8U	17 U	12 U	yes	44 U	1.1 U	1.9U	1.5 UJ	13 U	yes	yes
Endrin aldehyde	23,000		no	8081A	µg/kg	x	x	79 UJ	2.0 U				no	44 U	0.49 U				no	no
Endrin ketone			no	8081A	µg/kg	x		79 UJ	1.9 U				no	44 U	0.48 U				no	no
gamma-BHC (Lindane)	1.22		yes	8081A	µg/kg	x	x	41 UJ	0.98 U		3.9 U	2.8 U	yes	23 U	0.24 U		0.34 UJ	3 U	yes	yes
Heptachlor	4.9		yes	8081A	µg/kg	x	x	41 UJ	0.98 U		3.9 U	2.8 U	no	23 U	0.24 U		0.34 UJ	3 U	no	yes
Heptachlor epoxide	300	2	yes	8081A	µg/kg	x	x	41 UJ	0.98 U		3.9 U	2.8 U	no	23 U	0.24 U		0.34 UJ	3 U	no	no
Methoxychlor	19		yes	8081A	µg/kg	x	x	410 UJ	2.0 U		8.1 U	5.8 U	no	230 U	0.50 U		0.70 UJ	6.3 U	no	yes
Toxaphene	28	100	yes	8081A	µg/kg	x	x	790 UJ	350 U		1,400 U	1000 U	yes	440 U	86 U		120 UJ	1,100 U	yes	yes

Not an Appendix IX Compound
Detected below Action level
Reporting limit above Action level
Reporting limit above Action level but below PQL
Detected above Action level
Compound retained during optimization analysis
No Available Data

Action Level and Appendix B (App B) Compounds (B&RE, 1998)
Appendix IX (App IX) Compounds from 40CFR Part 264 Appendix IX

Qualifiers:
U - Non-detect, Reporting limit estimated.
UJ - Non-detect, Reporting limit listed.
R - Analyte result is rejected.

Table 21. SWMU-5 Surface Water Metals

Inorganics	Action Level (Surface Water)	PQL (Surface Water)	Retained for PMP Mod Nov-12	Method	Units	App B	TAL	Location						Location						Retained for PMP Modification Apr-14
								S5SW-01						S5SW-02						S5SW-03						
								Date Collected					Jan-14	Date Collected					Jan-14	Date Collected					Jan-14	
								Jan-03	Oct-10	Dec-11	Dec-12		Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	
Aluminum	1,500		no	6010B	µg/L	x	x	44U	100U	500U			no	21.9U	100U	500U			**no**	62.2U	100U	500U			no	no
Antimony	4,300		no	6010B	µg/L	x	x	6U	10U				no	6U	10U				**no**	6U	10U				no	no
Arsenic	50		no	6010B	µg/L	x	x	7.8U	**14 J**				no	7.8U	8.0U				**no**	7.8U	**5.7 J**				no	no
Barium	10,000		no	6010B	µg/L	x	x	**7.9**	**9.4 J**				no	**8.1**	**9.7 J**				**no**	**8.2**	**8.1 J**				no	no
Beryllium	0.28		yes	6010B	µg/L	x	x	0.6U	0.20U	1.5U	0.50 U	0.25 U	yes	0.6U	0.20U	1.5U	0.50 U	0.25 U	**yes**	0.6U	0.20U	1.5U	0.50 U	0.25 U	yes	yes
Cadmium	9.3		no	6010B	µg/L	x	x	0.75U	2.0U				no	1.2U	2.0U				**no**	0.75U	2.0U				no	no
Calcium			no	6010B	µg/L	x	x	**545,000**	**270,000**				no	**530,000**	**400,000**				**no**	**551,000**	**370,000**				no	no
Chromium	50		no	6010B	µg/L	x	x	2.1U	2.0U				no	2.1U	2.0U				**no**	2.1U	2.0U				no	no
Cobalt	35,000		no	6010B	µg/L	x	x	2.8U	**1.1 J**				no	2.8U	2.0U				**no**	2.8U	2.0U				no	no
Copper	2.9		yes	6010B	µg/L	x	x	5.7U	**2.3 J**	11U	**2.1 J**	1.1 U	no	5.7U	2.0U	11U	**1.6 J**	1.1 U	**no**	5.7U	2.0U	11U	1.1 U	1.1 U	no	no
Iron	300		yes	6010B	µg/L	x	x	4.7U	**63 J**	440U	**120**	**61 J**	no	4.7U	**75 J**	440U	**78 J**	**47 J**	**no**	12.3U	**240**	440U	**50 J**	44 U	no	no
Lead	5.6		no	6010B	µg/L	x	x	4.4U	4.0U	5.0U			no	4.4U	4.0U	5.0U			**no**	4.4U	4.0U	5.0U			no	no
Magnesium			no	6010B	µg/L	x	x	**1,760,000**	**660,000 D**				no	**1,690,000**	**1,200,000 D**				**no**	**1,850,000**	**1,200,000 D**				no	no
Manganese	10		no	6010B	µg/L	x	x	1.3U	2.0U				no	2.9U	2.0U				**no**	2.5U	2.0U				no	no
Mercury	1.26		yes	7470A	µg/L	x	x	0.05U	0.10U	4.0U	0.20 UJ	0.1 U	no	0.06U	0.10U	4.0U	0.10 UJ	**0.29**	**no**	0.06U	0.10U	4.0U	0.10 UJ	0.1 U	no	no
Nickel	8.3		yes	6010B	µg/L	x	x	3.2U	4.0U	20U	2.0 U	2 U	no	3.2U	4.0U	20U	2.0 U	2 U	**no**	3.2U	4.0U	20U	2.0 U	2 J	no	no
Potassium			no	6010B	µg/L	x	x	**495,000**	**230,000D**				no	**538,000**	**430,000 D**				**no**	**571,000**	420,000 D				no	no
Selenium	71		no	6010B	µg/L	x	x	10.6U	8.0U				no	10.6U	**7.4 J**				**no**	10.6U	8.0U				no	no
Silver	2.3		no	6010B	µg/L	x	x	2.5U	1.6U	1.8U			no	2.5U	1.6U	1.8U			**no**	2.5U	1.6U	1.8U			no	no
Sodium			no	6010B	µg/L	x	x	**4,100,000**	**6,400,000 D**				no	**3,300,000**	**14,000,000 D**				**no**	**4,400,000**	**11,000,000 D**				no	no
Thallium	7.3		no	6020	µg/L	x	x	14.3U	0.25U	2.5U			no	14.3U	0.25U	2.5U			**no**	14.3U	0.25U	2.5U			no	no
Tin	0.01		yes	6010B	µg/L	x		10U		14U	1.4 U	1.4 U	yes	10U		14U	1.4 U	1.4 U	**yes**	10U		14U	1.4 U	1.4 U	yes	yes
Vanadium	10,000		no	6010B	µg/L	x	x	4.4U	2.4U				no	4.3U	**5.2 J**				**no**	1.7U	**3.4 J**				no	no
Zinc	86		no	6010B	µg/L	x	x	**6.7**	10U				no	**6.3**	10U				**no**	**5.3**	10U				no	no

Not a Target Analyte List (TAL) Metal
Detected below Action level
Reporting limit above Action level
Detected above Action level
Compound retained during optimization analysis
No Available Data
Action Level and Appendix B (App B) Compounds (B&RE, 1998)
Target Analyte List (TAL) Compounds (B&RE, 1998)

Qualifiers:
D - Dilution Result.
J - Estimated concentration.
U - Non-detect, Reporting limit estimated.
UJ - Non-detect, Reporting limit listed.

Table 22. SWMU-5 Sediment Metals

Inorganics	Action Level (Sediment)	PQL (Sediment)	Retained for PMP Modification Nov-12	Method	Units	App B	TAL	Location											Retained for PMP Modification Apr-14
								S5SD-01						S5SD-02					
								Date Collected					Jan-14	Date Collected					Jan-14
								Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain
Aluminum	2,664		no	6010B	mg/kg	x	x	**2,520**	**780**				no	**1,320 J**	**1,500 J**				no	no
Antimony	12		no	6010B	mg/kg	x	x	0.49U	1.5U				no	0.36UJ	2.5U				no	no
Arsenic	7.24		no	6010B	mg/kg	x	x	**2.8 J**	**4.5**	**0.13**			no	3.1U	**2.1 J**	**4.7**			no	no
Barium	40		no	6010B	mg/kg	x	x	**8.3**	**6.7**				no	**7 J**	**11**				no	no
Beryllium	0.1		yes	6010B	mg/kg	x	x	0.17U	**0.052 J**	0.24U	0.070 U	0.036 U J	no	0.1UJ	**0.087 J**	0.19U	0.082 U	**0.051 J**	no	no
Cadmium	0.676		yes	6010B	mg/kg	x	x	**1.4**	**1.1**		**0.86**	**0.48**	yes	**0.91 J**	**0.6 J**		**0.40**	**0.32**	no	yes
Calcium			no	6010B	mg/kg	x	x	**205,000**	**160,000 D**				no	**156,000 J**	**330,000 DJ**				no	no
Chromium	52.3		no	6010B	mg/kg	x	x	**13.3 J**	**9.6**	**39**			no	**5.5 J**	**14**	**6.0**			no	no
Cobalt	0.48		yes	6010B	mg/kg	x	x	**0.37**	0.37U		**0.37**	**0.7 J**	yes	0.17UJ	**0.82 D**		**0.37**	**0.79 J**	yes	yes
Copper	18.7		no	6010B	mg/kg	x	x	**8.9 J**	**6.4**				no	**4.6 J**	**7.5 J**				no	no
Iron	2,398		no	6010B	mg/kg	x	x	**1,550 J**	**660**				no	**776 J**	**1,100 J**				no	no
Lead	34.18		no	6010B	mg/kg	x	x	**21.3**	**13**				no	**8.2 J**	**18**				no	no
Magnesium			no	6010B	mg/kg	x	x	**15,200**	**5,600**				no	**14,500 J**	**16,000 J**				no	no
Manganese	460		no	6010B	mg/kg	x	x	**14.9 J**	**5.7**				no	**9.8 J**	**15**				no	no
Mercury	0.13	0.02	no	7471A	mg/kg	x	x	**0.06**	**0.043**				no	**0.04 J**	**0.034 J**				no	no
Nickel	15.9		no	6010B	mg/kg	x	x	**3.5 J**	**1.6 J**				no	**1.8 J**	**3.7 J**				no	no
Potassium			no	6010B	mg/kg	x	x	**1,740 J**	**1,000**				no	**2,200 J**	**1,600 J**				no	no
Selenium	1.42		yes	6010B	mg/kg	x	x	0.56U	0.93U		0.70 U	0.36 U	no	0.65UJ	1.5U		0.82 U	0.47 U	no	no
Silver	0.733		yes	6010B	mg/kg	x	x	0.65U	0.30U		0.14 U	0.073 U	no	0.75UJ	0.49U		0.16 U	0.093 U	no	no
Sodium			no	6010B	mg/kg	x	x	**33,600**	**18,000 D**				no	**48,700 J**	**30,000 DJ**				no	no
Thallium			no	6010B	mg/kg	x	x	0.75U	3.7U				no	0.87UJ	6.1U				no	no
Tin	1.98		yes	6010B	mg/kg	x		5.3U			7.1 U	3.8 U	yes	6.1U			8.3 U	4.9 U	yes	yes
Vanadium	10.44		yes	6010B	mg/kg	x	x	**10.6**	**7.1**		**6.2**	**3.3 J**	no	**4.9 J**	**6.2**		**5.8**	**5.6 J**	no	no
Zinc	124		no	6010B	mg/kg	x	x	**48**	**45**				no	**16 J**	**28**				no	no

Not a Target Analyte List (TAL) Metal
Detected below Action level
Reporting limit above Action level
Detected above Action level
Compound retained during optimization analysis
No Available Data
Action Level and Appendix B (App B) Compounds (B&RE, 1998)
Target Analyte List (TAL) Compounds (B&RE, 1998)

Qualifiers:
D - Dilution Result.
J - Estimated concentration.
U - Non-detect, Reporting limit estimated.
UJ - Non-detect, Reporting limit listed.

Table 23. SWMU-7 Surface Water Metals

Inorganics	Action Level (Surface Water)	PQL (Surface Water)	Retained for PMP Modification Nov-12	Method	Units	App B	TAL	Location										
								S7SW-05						S7SW-06				
								Date Collected					Jan-14	Date Collected				Jan-14
								Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain
Aluminum	1,500		no	6010B	µg/L	x	x	67.9U	100U	500U			no		100U	500U			no
Antimony	4,300		no	6010B	µg/L	x	x	2.2U	10U	20U			no		10U	20U			no
Arsenic	50		no	6010B	µg/L	x	x	1.6U	8.0U				no		8.0U				no
Barium	10,000		no	6010B	µg/L	x	x	**6.6**	**18**				no		**15**				no
Beryllium	0.28		yes	6010B	µg/L	x	x	0.12U	0.20U	1.5U	0.50 U	0.25 U	no		0.20U	1.5U	0.50 U	0.25 U	no
Cadmium	9.3		no	6010B	µg/L	x	x	0.15U	2.0U				no		2.0U				no
Calcium			no	6010B	µg/L	x	x	**122,000**	**280,000**				no		**230,000**				no
Chromium	50		no	6010B	µg/L	x	x	**1.2**	2.0U				no		2.0U				no
Cobalt	35,000		no	6010B	µg/L	x	x	0.55U	2.0U				no		2.0U				no
Copper	2.9		yes	6010B	µg/L	x	x	**2**	2.0U		1.1 U	**28**	yes		2.0U		**1.7 J**	**11**	yes
Iron	300		no	6010B	µg/L	x	x	**154**	**130**				no		**190**				no
Lead	5.6		no	6010B	µg/L	x	x	**2.5**	4.0U				no		4.0U				no
Magnesium			no	6010B	µg/L	x	x	**127,000**	**690,000 D**				no		**590,000 D**				no
Manganese	10		yes	6010B	µg/L	x	x	**2.8**	**13**		**26**	**60**	yes		**8.5 J**		**36**	**74**	yes
Mercury	1.26		yes	7470A	µg/L	x	x	0.06U	0.10U	4.0U	**0.12 J**	0.1 U	no		0.10U	4.0U	0.10 UJ	0.1 U	no
Nickel	8.3		no	6010B	µg/L	x	x	0.64U	4.0U				no		4.0U				no
Potassium			no	6010B	µg/L	x	x	**36,400**	**230,000 D**				no		**210,000 D**				no
Selenium	71		no	6010B	µg/L	x	x	2.1U	8.0U				no		8.0U				no
Silver	2.3		no	6010B	µg/L	x	x	0.49U	1.6U				no		1.6U				no
Sodium			no	6010B	µg/L	x	x	**906,000**	**6,600,000 D**				no		**5,600,000 D**				no
Thallium	7.3		no	6020	µg/L	x	x	2.9U	0.25U				no		0.25U				no
Tin	0.01		yes	6010B	µg/L	x		2U			1.4 U	1.4 U	yes				1.4 U	1.4 U	yes
Vanadium	10,000		no	6010B	µg/L	x	x	1.2U	2.4U				no		2.4U				no
Zinc	86		no	6010B	µg/L	x	x	**5**	**12 J**				no		**10 J**				no

Inorganics	Action Level (Surface Water)	PQL (Surface Water)	Retained for PMP Modification Nov-12	Method	Units	App B	TAL	Location						Retained for PMP Modification Apr-14
								S7SW-08						
								Date Collected					Jan-14	
								Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	
Aluminum	1,500		no	6010B	µg/L	x	x		100U	500U			no	no
Antimony	4,300		no	6010B	µg/L	x	x		10U	20U			no	no
Arsenic	50		no	6010B	µg/L	x	x		**9.5 J**				no	no
Barium	10,000		no	6010B	µg/L	x	x		**15**				no	no
Beryllium	0.28		yes	6010B	µg/L	x	x		0.20U	1.5U	0.50 U	0.25 U	no	no
Cadmium	9.3		no	6010B	µg/L	x	x		2.0U				no	no
Calcium			no	6010B	µg/L	x	x		**240,000**				no	no
Chromium	50		no	6010B	µg/L	x	x		2.0U				no	no
Cobalt	35,000		no	6010B	µg/L	x	x		2.0U				no	no
Copper	2.9		yes	6010B	µg/L	x	x		**3.3 J**		**1.3 J**	**7.2**	yes	yes
Iron	300		no	6010B	µg/L	x	x		**170**				no	no
Lead	5.6		no	6010B	µg/L	x	x		4.0U				no	no
Magnesium			no	6010B	µg/L	x	x		**650,000 D**				no	no
Manganese	10		yes	6010B	µg/L	x	x		**13**		**46**	**76**	yes	yes
Mercury	1.26		yes	7470A	µg/L	x	x		0.10U	4.0U	0.10 UJ	0.1 U	no	no
Nickel	8.3		no	6010B	µg/L	x	x		4.0U				no	no
Potassium			no	6010B	µg/L	x	x		**240,000 D**				no	no
Selenium	71		no	6010B	µg/L	x	x		8.0U				no	no
Silver	2.3		no	6010B	µg/L	x	x		1.6U				no	no
Sodium			no	6010B	µg/L	x	x		**6,600,000 D**				no	no
Thallium	7.3		no	6020	µg/L	x	x		0.25U				no	no
Tin	0.01		yes	6010B	µg/L	x					1.4 U	1.4 U	yes	yes
Vanadium	10,000		no	6010B	µg/L	x	x		2.4U				no	no
Zinc	86		no	6010B	µg/L	x	x		**25**				no	no

Not a Target Analyte List (TAL) Metal
Detected below Action level
Reporting limit above Action level
Detected above Action level
Compound retained during optimization analysis
No Available Data
Action Level and Appendix B (App B) Compounds (B&RE, 1998)
Target Analyte List (TAL) Compounds (B&RE, 1998)

Qualifiers:
D - Dilution Result.
J - Estimated concentration.
U - Non-detect, Reporting limit estimated.
UJ - Non-detect, Reporting limit listed.

Table 24. SWMU-7 Surface Water Pesticides and Polychlorinated Biphenyls

Pesticides	Action Level (Surface Water)	PQL (Surface Water)	Retained for PMP Mod Nov-12	Method	Units	App B	App IX	Location																Retained for PMP Modification Apr-14
								S7SW-05						S7SW-06						S7SW-08					
								Date Collected					Jan-14	Date Collected					Jan-14	Date Collected					Jan-14
								Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	
4,4'-DDD	0.0064	0.08	yes	8081A	µg/L	x	x	0.10U	0.10 U		0.0097 UJ	0.0094 UJ	no		0.10 U		0.0093 UJ	0.0094 UJ	no		0.10 U		0.0098 UJ	0.0094 UJ	no	no
4,4'-DDE	0.14	0.08	no	8081A	µg/L	x	x	0.10U	0.10 U				no		0.10 U				no		0.10 U				no	no
4,4'-DDT	0.00059	0.2	yes	8081A	µg/L	x	x	0.10UJ	0.10 U		0.0097 UJ	0.0094 UJ	no		0.10 U		0.0093 UJ	0.0094 UJ	no		0.10 U		0.0098 UJ	0.0094 UJ	no	no
Aldrin	0.00014	0.05	yes	8081A	µg/L	x	x	0.050U	0.070 U		0.0068 UJ	0.0066 UJ	no		0.070 U		0.0065 UJ	0.0066 UJ	no		0.070 U		0.0068 UJ	0.0066 UJ	no	no
alpha-BHC	0.34	0.05	no	8081A	µg/L	x	x	0.050U	0.057 U				no		0.057 U				no		0.057 U				no	no
beta-BHC	0.046	0.05	yes	8081A	µg/L	x	x	0.050U	0.067 U		0.0065 UJ	0.0063 UJ	no		0.067 U		0.0063 UJ	0.0063 UJ	no		0.067 U		0.0065 UJ	0.0063 UJ	no	no
Chlordane (technical)	0.052	0.8	yes	8081A	µg/L	x	x	0.050U	1.3 U		0.13 UJ	0.12 UJ	no		1.3 U		0.12 UJ	0.12 UJ	no		1.3 U		0.13 UJ	0.12 UJ	no	no
delta-BHC	0.34		no	8081A	µg/L	x	x	0.050U	0.050 U				no		0.050 U				no		0.050 U				no	no
Dieldrin	0.00014	0.1	yes	8081A	µg/L	x	x	0.10U	0.10 U		0.0097 UJ	0.0094 UJ	no		0.10 U		0.0093 UJ	0.0094 UJ	no		0.10 U		0.0098 UJ	0.0094 UJ	no	no
Endosulfan I	0.0087	0.1	yes	8081A	µg/L	x	x	0.050U	0.050 U		0.0048 UJ	0.0047 UJ	no		0.050 U		0.0047 UJ	0.0047 UJ	no		0.050 U		0.0049 UJ	0.0047 UJ	no	no
Endosulfan II	0.0087	0.1	yes	8081A	µg/L	x	x	0.10U	0.10 U		0.0097 UJ	0.0094 UJ	no		0.10 U		0.0093 UJ	0.0094 UJ	no		0.10 U		0.0098 UJ	0.0094 UJ	no	no
Endosulfan sulfate	0.1	0.1	no	8081A	µg/L	x	x	0.10U	0.10 U				no		0.10 U				no		0.10 U				no	no
Endrin	0.0023	0.2	yes	8081A	µg/L	x	x	0.10U	0.10 U		0.0097 UJ	0.0094 UJ	no		0.10 U		0.0093 UJ	0.0094 UJ	no		0.10 U		0.0098 UJ	0.0094 UJ	no	no
Endrin aldehyde			no	8081A	µg/L	x	x	0.10U	0.16 U				no		0.16 U				no		0.16 U				no	no
Endrin ketone			no	8081A	µg/L	x		0.10UJ	0.10 U				no		0.10 U				no		0.10 U				no	no
gamma-BHC (Lindane)	0.063	0.1	no	8081A	µg/L	x	x	0.050U	0.059 U				no		0.059 U				no		0.059 U				no	no
Heptachlor	0.00021	0.05	yes	8081A	µg/L	x	x	0.050U	0.070 U		0.0068 UJ	0.0066 UJ	no		0.070 U		0.0065 UJ	0.0066 UJ	no		0.070 U		0.0068 UJ	0.0066 UJ	no	no
Heptachlor epoxide	0.0036	0.08	yes	8081A	µg/L	x	x	0.050U	0.060 U		0.0058 UJ	0.0057 UJ	no		0.060 U		0.0056 UJ	0.0056 UJ	no		0.060 U		0.0059 UJ	0.0057 UJ	no	no
Methoxychlor	0.03	0.2	yes	8081A	µg/L	x	x	0.50UJ	0.13 U		0.013 UJ	0.012 UJ	no		0.13 U		0.012 UJ	0.012 UJ	no		0.13 U		0.013 UJ	0.012 UJ	no	no
PCB-1016	0.000045	1	yes	8081A	µg/L	x	x	0.50U	2.0 U		0.19 UJ	0.19 UJ	no		2.0 U		0.19 UJ	0.19 UJ	no						no	no
PCB-1221	0.000045	1	yes	8081A	µg/L	x	x	0.50U	2.8 U		0.27 UJ	0.26 UJ	no		2.8 U		0.26 UJ	0.26 UJ	no						no	no
PCB-1232	0.000045	1	yes	8081A	µg/L	x	x	0.50U	2.0 U		0.19 UJ	0.19 UJ	no		2.0 U		0.19 UJ	0.19 UJ	no						no	no
PCB-1242	0.000045	1	yes	8081A	µg/L	x	x	0.50U	2.0 U		0.19 UJ	0.19 UJ	no		2.0 U		0.19 UJ	0.19 UJ	no						no	no
PCB-1248	0.000045	1	yes	8081A	µg/L	x	x	0.50U	3.6 U		0.35 UJ	0.34 UJ	no		3.6 U		0.34 UJ	0.34 UJ	no						no	no
PCB-1254	0.000045	1	yes	8081A	µg/L	x	x	0.50U	2.6 U		0.25 UJ	0.24 UJ	no		2.6 U		0.24 UJ	0.24 UJ	no						no	no
PCB-1260	0.000045	1	yes	8081A	µg/L	x	x	0.50U	2.0 U		0.19 UJ	0.19 UJ	no		2.0 U		0.19 UJ	0.19 UJ	no						no	no
Toxaphene	0.0002	3	yes	8081A	µg/L	x	x	1.0U	5.0 U		0.48 UJ	0.47 UJ	no		5.0 U		0.47 UJ	0.47 UJ	no		5.0 U		0.49 UJ	0.47 UJ	no	no

PQL listed in 62-777 FAC PQL Table E (Marine Surface Water)
Not an Appendix IX Compound
Detected below Action level
Reporting limit above Action level
Reporting limit above Action level but below PQL
Detected above Action level
Compound retained during optimization analysis
No Available Data
Action Level and Appendix B (App B) Compounds (B&RE, 1998)
Appendix IX (App IX) Compounds from 40CFR Part 264
Appendix IX

Qualifiers:
U - Non-detect, Reporting limit estimated.
UJ - Non-detect, Reporting limit listed.

Table 25. SWMU-7 Sediment Metals

Inorganics	Action Level (Sediment)	PQL (Sediment)	Retained for PMP Modification Nov-12	Method	Units	App B	TAL	Location												Location						Retained for PMP Modification Apr-14
								S7SD-05						S7SD-06						S7SD-08						
								Date Collected					Jan-14	Date Collected					Jan-14	Date Collected					Jan-14	
								Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	
Aluminum	2,664		yes	6010B	mg/kg	x	x	**1,330**	**3,000**		**1,800**	**2,300 J**	no	**4,100J**	**1,900**		**1,700**	**4000 J**	yes	**2,350J**	**320**		**1,500**	**870 J**	no	yes
Antimony	12		no	6010B	mg/kg	x	x	0.98U	1.4 U				no	**8.1J**	1.3 U				no	1.9U	1.3 U				no	
Arsenic	7.24		no	6010B	mg/kg	x	x	**2.2J**	**4.6**	**4.2**			no	**5.6J**	**1.6 J**	**2.1**			no	2.2U	**1.6 J**	**2.4 J**			no	
Barium	40		no	6010B	mg/kg	x	x	**7.6**	**10**				no	**12J**	**14**				no	**12.1J**	**15**				no	
Beryllium	0.1		yes	6010B	mg/kg	x	x	0.12U	**0.075 J**		0.096 U	0.068 UJ	no	0.17UJ	**0.087 J**		**0.074 J**	**0.14 J**	yes	0.19U	0.034 U		0.095 U	0.038 UJ	no	yes
Cadmium	0.676		yes	6010B	mg/kg	x	x	**0.81**	**0.25 J**		**0.47**	**0.36**	no	**5.0J**	0.33 U		**0.60**	**6.7**	yes	**1.4J**	0.34 U		**1.4**	**0.4**	yes	yes
Calcium			no	6010B	mg/kg	x	x	**210,000**	**370,000 D**				no	**163,000J**	**390,000 D**				no	**174,000J**	**480,000 D**				no	
Chromium	52.3		no	6010B	mg/kg	x	x	**4.5J**	**12**				no	**38.7J**	**6.2**				no	**10.8J**	**6.5**				no	
Cobalt	0.48		yes	6010B	mg/kg	x	x	**0.25**	**1.4 J**		**0.65**	**0.58 J**	yes	**1.4J**	**0.27 J**		**0.81**	**3.4 J**	yes	**0.66J**	**0.26 J**		**1.0**	**0.7 J**	yes	yes
Copper	18.7		yes	6010B	mg/kg	x	x	**9.8J**	**28**		**13**	**10 J**	no	**104J**	**13**		**20**	**54 J**	yes	**46.2J**	**4.1 J**		**61**	**17 J**	yes	yes
Iron	2,398		yes	6010B	mg/kg	x	x	**1,260J**	**4,100**		**1,400**	**1,700 J**	no	**6,210J**	**1,400**		**2,000**	**5800 J**	yes	**3,570J**	**650**		**4,100**	**1300 J**	yes	yes
Lead	34.18		yes	6010B	mg/kg	x	x	**17.1**	**61**		**20**	**11 J**	no	**134J**	**19**		**49**	**120 J**	yes	**29.8J**	**21**		**85**	**36 J**	yes	yes
Magnesium			no	6010B	mg/kg	x	x	**2,740**	**3,700**				no	**5,600J**	**6,300**				no	**7,230J**	**7,600**				no	
Manganese	460		no	6010B	mg/kg	x	x	**9.2J**	**34**				no	**25.8J**	**29**				no	**43.6J**	**45**				no	
Mercury	0.13	0.02	yes	7471A	mg/kg	x	x	**0.07**	**0.016 J**		**0.11**	**0.068**	no	**0.96J**	**0.053**		**0.40**	**0.37**	yes	**0.09J**	**0.019 J**		**0.23**	**0.041**	yes	yes
Nickel	15.9		no	6010B	mg/kg	x	x	**2.0J**	**3.0 J**				no	**15.6J**	**2.0 J**				no	**4.3J**	**0.82 J**				no	
Potassium			no	6010B	mg/kg	x	x	350U	**600**				no	1,160U	**530**				no	485U	**340**				no	
Selenium	1.42		yes	6010B	mg/kg	x	x	**0.79**	0.90 U		0.96 U	**1.2 J**	no	**1.8J**	**0.82 U**		**0.42 U**	**0.59 J**	no	**1.0J**	0.84 U		0.95 U	0.38 U	no	no
Silver	0.733		yes	6010B	mg/kg	x	x	0.39U	0.29 U		**0.52**	**0.28**	no	**14.3J**	**0.42 J**		**3.1**	**11**	yes	0.94UJ	0.27 U		**1.8**	**0.7**	yes	yes
Sodium			no	6010B	mg/kg	x	x	**3,060**	**7,000**				no	**9,020J**	**5,200**				no	**5,860J**	**5,700**				no	
Thallium			no	6010B	mg/kg	x	x	0.45U	3.6 U				no	1.5UJ	3.3 U				no	1.1UJ	3.4 U				no	
Tin	1.98		yes	6010B	mg/kg	x		4.3U			9.8 U	7.1 U	yes	24.2U			**7.1 J**	**12 J**	yes	9.6U			9.6 U	4 U	yes	yes
Vanadium	10.44		yes	6010B	mg/kg	x	x	**7.4**	**15**		**6.2**	**5.5 J**	no	**22.5J**	**2.6**		**5.0**	**9.4 J**	no	**8.9J**	**2.7**		**9.0**	**3.5 J**	no	no
Zinc	124		yes	6010B	mg/kg	x	x	**33.9**	**290**		**640**	**100 J**	yes	760J	**40**		**93**	**290 J**	yes	**125J**	**40**		**200**	**56 J**	yes	yes

Not a Target Analyte List (TAL) Metal
Detected below Action level
Reporting limit above Action level
Detected above Action level
Compound retained during optimization analysis
No Available Data
Action Level and Appendix B (App B) Compounds (B&RE, 1998)
Target Analyte List (TAL) Compounds (B&RE, 1998)

Qualifiers:
D - Dilution Result.
J - Estimated concentration.
U - Non-detect, Reporting limit estimated.
UJ - Non-detect, Reporting limit listed.

Table 26. SWMU-7 Sediment Semi-Volatile Organic Compounds (SVOCs)

SVOCs*	Action Level (Sediment)	PQL (Sediment)	Retained for PMP Mod Nov-12	Method	Units	App B	App IX	Location						Location						Retained for PMP Modification Apr-14
								S7SD-05						S7SD-06						S7SD-08						
								Date Collected					Jan-14	Date Collected					Jan-14	Date Collected					Jan-14	
								Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	
Benzo[b]fluoranthene	3,200		yes	8270C	µg/kg	x	x			39UJ	66 U	**12 J**	no			**7,900 J**	**13000 J**	**1,400**	yes			**150 J**	**140 M**	59 U	no	yes

Detected below Action level
Detected above Action level
Compound retained during optimization analysis
No Available Data

* Only one SVOCs has ever been analyzed, beginning in December 2011
Action Level and Appendix B (App B) Compounds (B&RE, 1998)
Appendix IX (App IX) Compounds from 40CFR Part 264 Appendix IX

Qualifiers:
M - Manually integrated analyte.
J - Estimated concentration.
U - Non-detect, Reporting limit estimated.
UJ - Non-detect, Reporting limit listed.

Table 27. SWMU-7 Sediment Pesticides and Polychlorinated Biphenyls (PCBs)

Pesticides/PCBs	Action Level (Sediment)	PQL (Sediment)	Retained for PMP Mod Nov-12	Method	Units	App B	App IX	Location											Location							Retained for PMP Modification Apr-14
								S7SD-05						S7SD-06							S7SD-08						
								Date Collected					Jan-14	Date Collected					Jan-14		Date Collected					Jan-14	
								Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	
4,4'-DDD	1.78		yes	8081A-8082	µg/kg	x	x	**48**	**160**		**17 J**	**21 J**	yes	20UJ	0.56U		**50**	**64 J**	yes	14UJ	0.56U		5.0 UJ	15 U	yes	yes
4,4'-DDE	2.07		yes	8081A-8082	µg/kg	x	x	**140**	**1,300J**		**42**	**33 J**	yes	120J	**76**		**730 R**	**820**	yes	**12J**	**6.2**		**68 J**	**93**	yes	yes
4,4'-DDT	1.76		yes	8081A-8082	µg/kg	x	x	7.7UJ	**84**		5.4 U	10 U	yes	100J	**9.8**		**80**	**19 J**	yes	**5J**	0.56U		**5.8 J**	15 U	yes	yes
Aldrin	60		no	8081A-8082	µg/kg	x	x	4.0U	8.7U				no	10UJ	0.77U				no	7.5UJ	0.77U				no	no
alpha-BHC	1.05	2	yes	8081A-8082	µg/kg	x	x	4.1U	3.3U		2.8 U	5.1 U	yes	10UJ	0.29U		2.9 U	8.6 U	yes	7.5UJ	0.29U		2.6 UJ	7.6 U	yes	yes
beta-BHC	5	2	yes	8081A-8082	µg/kg	x	x	4.0U	6.3U		5.4 U	10 U	yes	10UJ	0.56U		5.7 U	17 U	yes	7.5UJ	0.56U		5.0 UJ	15 U	yes	yes
Chlordane (technical)	490		no	8081A-8082	µg/kg	x	x	4.0U	56U				no	**31 J**	4.9U				no	7.5UJ	5.0U				no	no
delta-BHC	3		yes	8081A-8082	µg/kg	x	x	**4.7**	3.3U		2.8 U	5.1 U	yes	10UJ	0.29U		2.9 U	8.6 U	yes	7.5UJ	0.29U		2.6 UJ	7.6 U	yes	yes
Dieldrin	0.715	3	yes	8081A-8082	µg/kg	x	x	**2.4J**	6.3U		5.4 U	10 U	yes	20UJ	0.56U		**59**	**20 J**	yes	14UJ	0.56U		**4.5 J**	15 U	yes	yes
Endosulfan I	2.9	4	yes	8081A-8082	µg/kg	x	x	4.0U	3.3U		2.8 U	5.1 U	yes	10UJ	0.29U		2.9 U	8.6 U	yes	7.5UJ	0.29U		2.6 UJ	7.6 U	yes	yes
Endosulfan II	14	4	yes	8081A-8082	µg/kg	x	x	7.7U	6.3U		5.4 U	10 U	no	20UJ	0.56U		5.7 U	17 U	yes	14UJ	0.56U		5.0 UJ	15 U	yes	yes
Endosulfan sulfate		4	no	8081A-8082	µg/kg	x	x	7.7U	6.3U				no	20UJ	**2.2 J**				no	14UJ	0.56U				no	no
Endrin	3.3	5	yes	8081A-8082	µg/kg	x	x	7.7U	14U		12 U	22 U	yes	**24 J**	1.2U		13 U	37 U	yes	14UJ	1.2U		11 UJ	32 U	yes	yes
Endrin aldehyde	23,000		no	8081A-8082	µg/kg	x	x	7.7U	6.5U				no	20UJ	0.58U				no	14UJ	0.58U				no	no
Endrin ketone			no	8081A-8082	µg/kg	x		7.7UJ	6.3U				no	20UJ	0.56U				no	14UJ	0.56U				no	no
gamma-BHC (Lindane)	1.22		yes	8081A-8082	µg/kg	x	x	4.0U	3.3U		2.8 U	5.1 U	yes	10UJ	0.29U		2.9 U	8.6 U	yes	7.5UJ	0.29U		2.6 UJ	7.6 U	yes	yes
Heptachlor	4.9		yes	8081A-8082	µg/kg	x	x	4.0U	3.3U		2.8 U	5.1 U	yes	10UJ	0.29U		2.9 U	8.6 U	yes	7.5UJ	0.29U		2.6 UJ	7.6 U	yes	yes
Heptachlor epoxide	300	2	no	8081A-8082	µg/kg	x	x	4.0U	3.3U				no	10UJ	0.29U				no	7.5UJ	0.29U				no	no
Methoxychlor	19		yes	8081A-8082	µg/kg	x	x	40UJ	6.7U		5.7 U	11 U	no	100UJ	0.60U		6.1 U	18 U	no	75UJ	0.6U		5.3 UJ	16 U	no	no
PCB-1016	22.7	40	yes	8081A-8082	µg/kg	x	x	40U	130U	6.9U	110 U	200 U	yes	100UJ	11U	4.8U	120 U	340 UJ	yes			19U			no	yes
PCB-1221	22.7	40	yes	8081A-8082	µg/kg	x	x	40U	130U	11U	110 U	200 U	yes	100UJ	11U	8.0U	120 U	340 U	yes			31U			no	yes
PCB-1232	22.7	40	yes	8081A-8082	µg/kg	x	x	40U	63U	7.9U	54 U	100 U	yes	100UJ	5.6U	5.5U	57 U	170 U	yes			21U			no	yes
PCB-1242	22.7	40	yes	8081A-8082	µg/kg	x	x	40U	130U	6.7U	110 U	200 U	yes	100UJ	11U	4.6U	120 U	340 U	yes			18U			no	yes
PCB-1248	22.7	40	yes	8081A-8082	µg/kg	x	x	40U	140U	17U	120 U	220 U	yes	100UJ	12U	12U	120 U	360 U	yes			46U			no	yes
PCB-1254	22.7	40	yes	8081A-8082	µg/kg	x	x	40U	63U	5.5U	54 U	100 U	yes	100UJ	5.6U	3.8U	57 U	170 U	yes			15U			no	yes
PCB-1260	22.7	40	yes	8081A-8082	µg/kg	x	x	**58**	130U	16U	110 U	200 U	yes	1800J	11U	11U	120 U	340 UJ	yes			43U			no	yes
Toxaphene	28	100	yes	8081A-8082	µg/kg	x	x	77U	1,200U		980 U	1,800 U	yes	200UJ	100U		1000 U	3000 U	yes	140UJ	100U		910 UJ	2700 U	yes	yes

Not an Appendix IX Compound
Detected below Action level
Reporting limit above Action level
Reporting limit above Action level but below PQL
Detected above Action level
Compound retained during optimization analysis
No Available Data

Action Level and Appendix B (App B) Compounds (B&RE, 1998)
Appendix IX (App IX) Compounds from 40CFR Part 264 Appendix IX

Qualifiers:
J - Estimated concentration.
U - Non-detect, Reporting limit estimated.
UJ - Non-detect, Reporting limit listed.

Table 28. IR-1 Groundwater Metals

Inorganics	Action Level (Ground-water)	PQL (Ground-water)	Action Level (Surface Water)	PQL (Surface Water)	Retained for PMP Modification Nov-12	Method	Units	App B	TAL	Location											
										I1MW1-1						I1MW1-2R					
										Date Collected					Jan-14	Date Collected					Jan-14
										Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain
Aluminum	37,000		1,500		no	6010B	µg/L	x	x	19.3U	100U				no	19.3U					no
Antimony	6		4,300		yes	6020	µg/L	x	x	**4.2**	**23 D**	**35 JD**	**26**	**40**	yes	3.6U		20U	**6.5**	**3.5 J**	yes
Arsenic	50		50		no	6010B	µg/L	x	x	1.6U	8.0U				no	4.7U					no
Barium	2,000		10,000		no	6010B	µg/L	x	x	**9.9**	**16**				no	**128**					no
Beryllium	4		0.28		yes	6010B	µg/L	x	x	0.12U	0.20U		0.25 U	0.25 U	no	0.36U			0.25 U	0.25 U	no
Cadmium	5		9.3		no	6010B	µg/L	x	x	0.15U	2.0U				no	0.45U					no
Calcium					no	6010B	µg/L	x	x	**160,000**	**140,000**				no	**356,000**					no
Chromium	100		50		no	6010B	µg/L	x	x	0.42U	**1.4 J**				no	1.3U					no
Cobalt	2,200		35,000		no	6010B	µg/L	x	x	0.55U	2.0U				no	1.7U					no
Copper	1,500		2.9		yes	6010B	µg/L	x	x	1.1U	**21**		**15**	**9**	yes	**83.4**			**9.8**	**9.9**	yes
Iron	11,000		300		yes	6010B	µg/L	x	x	4.7U	**69 J**		44 U	44 U	no	**616**			44 U	44 U	no
Lead	15		5.6		yes	6010B	µg/L	x	x	0.87U	**4.8 J**		**1.9**	**1 J**	no	**5.9**			**0.51 J**	0.5 U	no
Magnesium					no	6010B	µg/L	x	x	**132,000**	**95,000**				no	**853,000**					no
Manganese	840		10		yes	6010B	µg/L	x	x	**4.4**	2.0U		2.0 U	2 U	no	**304**			**22**	**7**	yes
Mercury	2		1.26		no	7470A	µg/L	x	x	0.08U	0.10U				no	0.14U					no
Nickel	100		8.3		yes	6010B	µg/L	x	x	**1.6**	**3.5 J**		**3.8 J**	**4.6 J**	no	**35.3**			**4.1 J**	**2.3 J**	no
Potassium					no	6010B	µg/L	x	x	**47,900**	**39,000 D**				no	**305,000**					no
Selenium	50		71		no	6010B	µg/L	x	x	**2.7**	8.0U				no	6.4U					no
Silver	180		2.3		no	6010B	µg/L	x	x	0.49U	1.6U				no	1.5U					no
Sodium	160,000				no	6010B	µg/L	x	x	**705,000**	**660,000 D**				no	**6,600,000**					no
Thallium	4.62		7.3		yes	6020	µg/L	x	x	2.9U	0.25U	2.5U	0.25 U	0.25 U	no	8.6U		2.5U	0.25 U	0.25 U	no
Tin	22,000		0.01		yes	6010B	µg/L	x		2.0U			1.4 U	1.4 U	yes	6.0U			1.4 U	1.4 U	yes
Vanadium	260		10,000		no	6010B	µg/L	x	x	**7.4**	**5.2 J**				no	1.0U					no
Zinc	11,000		86		no	6010B	µg/L	x	x	**1.2**	**31**				no	**60.6**					no

Inorganics	Action Level (Ground-water)	PQL (Ground-water)	Action Level (Surface Water)	PQL (Surface Water)	Retained for PMP Modification Nov-12	Method	Units	App B	TAL	Location														Retained for PMP Mod Apr-14
										I1MW-01										I1MW-03						
										Date Collected							Jan-14	Date Collected						Jan-14	
										Jan-03	Jan-03 Dup	Oct-10	Oct-10 Dup	Dec-11	Dec-12	Dec-13	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	
Aluminum	37,000		1,500		no	6010B	µg/L	x	x	19.3U	19.3U	100U	100U				no	19.3U	100U				no	no
Antimony	6		4,300		yes	6020	µg/L	x	x	**13.3**	**3.8**	**8.2 D**	**8.4 D**	**35 J**	**8.4**	**11**	yes	**6.4**	**6.6 D**		**5.4**	**4.3 J**	no	yes
Arsenic	50		50		no	6010B	µg/L	x	x	**4.6**	1.6U	8.0U	**11 J**				no	4.7U	8.0U				no	no
Barium	2,000		10,000		no	6010B	µg/L	x	x	**35.4**	**10.4**	**16**	**16**				no	**46.1**	**39**				no	no
Beryllium	4		0.28		yes	6010B	µg/L	x	x	0.12U	0.12U	0.20U	0.20U		0.25 U	0.25 U	no	0.36U	0.20U		0.25 U	0.25 U	no	yes
Cadmium	5		9.3		no	6010B	µg/L	x	x	0.15U	0.15U	2.0U	2.0U				no	0.45U	2.0U				no	no
Calcium					no	6010B	µg/L	x	x	**162,000**	**166,000**	**93,000**	**93,000**				no	**233,000**	**210,000**				no	no
Chromium	100		50		no	6010B	µg/L	x	x	**3.2**	0.42U	2.0U	2.0U				no	1.3U	**3.9 J**				no	no
Cobalt	2,200		35,000		no	6010B	µg/L	x	x	0.55U	0.55U	**0.97 J**	**0.97 J**				no	1.7U	2.0U				no	no
Copper	1,500		2.9		yes	6010B	µg/L	x	x	**30.1**	1.1U	**10 J**	**10 J**		**10**	**13**	yes	3.4U	**4.6 J**		**2.8 J**	**5.8**	yes	yes
Iron	11,000		300		yes	6010B	µg/L	x	x	4.7U	4.7U	50U	50U		44 U	44 U	no	37.1U	**57 J**		44 U	44 U	no	yes
Lead	15		5.6		yes	6010B	µg/L	x	x	0.87U	0.87U	4.0U	4.0U		0.50 U	0.5 U	no	2.6U	4.0U		**0.50 J**	0.5 U	no	yes
Magnesium					no	6010B	µg/L	x	x	**207,000**	**132,000**	**79,000**	**79,000**				no	**641,000**	**470,000 D**				no	no
Manganese	840		10		yes	6010B	µg/L	x	x	0.23U	4.7U	2.0U	2.0U		2.0 U	**2 J**	no	**28.5**	2.0U		2.0 U	**2.5 J**	no	yes
Mercury	2		1.26		no	7470A	µg/L	x	x	0.07U	0.09U	0.10U	0.10U				no	0.10U	0.10U				no	no
Nickel	100		8.3		yes	6010B	µg/L	x	x	**3.4**	**1.0**	4.0U	4.0U		**2.5 J**	**4.8 J**	no	1.9U	4.0U		2.0 U	**4.7 J**	no	yes
Potassium					no	6010B	µg/L	x	x	**60,100**	**47,400**	**34,000 D**	**34,000 D**				no	**212,000**	**170,000 D**				no	no
Selenium	50		71		no	6010B	µg/L	x	x	2.1U	4.2U	8.0U	8.0U				no	6.4U	8.0U				no	no
Silver	180		2.3		no	6010B	µg/L	x	x	0.49U	0.49U	1.6U	1.6U				no	1.5U	1.6U				no	no
Sodium	160,000				no	6010B	µg/L	x	x	**1,280,000**	**706,000**	**580,000 D**	**580,000 D**				no	**4,510,000**	**4,200,000 D**				no	no
Thallium	4.62		7.3		yes	6020	µg/L	x	x	2.9U	2.9U	0.25U	0.25U	2.5U	0.25 U	0.25 U	no	8.6U	0.25U		0.25 U	0.25 U	no	yes
Tin	22,000		0.01		yes	6010B	µg/L	x		2.0U	2.0U				1.4 U	1.4 U	yes	6.0U			1.4 U	1.4 U	yes	yes
Vanadium	260		10,000		no	6010B	µg/L	x	x	3.1U	**7.9**	**7.6 J**	**7.6 J**				no	1.7U	2.4U				no	no
Zinc	11,000		86		no	6010B	µg/L	x	x	**29.4**	**0.85**	**20**	**20**				no	**5.8**	**16 J**				no	no

Not a Target Analyte List (TAL) Metal

Detected below lowest Action level

Reporting limit above Action level

Detected above Surface Water Action level

Detected above Groundwater Action level

Compound retained during optimization analysis

* Sodium concentrations reflect seawater values (i.e., near 10,700,0 µg/L)

No Available Data

Action Level and Appendix B (App B) Compounds (B&RE, 1998)

Target Analyte List (TAL) Compounds (B&RE, 1998)

Qualifiers:

D - Dilution Result.

J - Estimated concentration.

U - Non-detect, Reporting limit estimated.

UJ - Non-detect, Reporting limit listed.

Table 29. IR-1 Sediment Metals

Inorganics	Action Level (Sediment)	PQL (Sediment)	Retained for PMP Modification Nov-12	Method	Units	App B	TAL	Location																							
								I1SD-01							I1SD-02							I1SD-03							I1SD-04						
								Date Collected						Jan-14	Date Collected						Jan-14	Date Collected						Jan-14	Date Collected						Jan-14
								Jan-03	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain
Aluminum	2,664		yes	6010B	mg/kg	x	x	**840**	**816**			**63**	**57**	no	**3,150**			**140**	**65**	no	**867**			**81**	**52**	**no**	**887**			**72**	**140**	no
Antimony	12		yes	6020	mg/kg	x	x	0.62U	1.3U			1.7 U	0.65 U	no	0.85U			1.0 U	0.82 U	no	0.4U			0.99 U	0.75 U	**no**	0.62U			0.87 U	0.8 U	no
Arsenic	7.24		yes	6010B	mg/kg	x	x	**4.7 J**	**8.9 J**			**3.0**	**1.1**	no	**6.7 J**			**2.2**	**3**	no	**5.6 J**			**2.1**	**3.1**	**no**	**5.2 J**			**3.3**	**1.8**	no
Barium	40		yes	6010B	mg/kg	x	x	**9.2**	**11.2**			**5.7**	**6.9**	no	**16.5**			**5.6**	**8.8**	no	**7**			**6.2**	**8.6**	**no**	**10.8**			**8.2**	**7.7**	no
Beryllium	0.1		yes	6010B	mg/kg	x	x	0.1U	0.06U			0.085 U	0.033 U	no	0.13U			0.050 U	0.041 U	no	0.09U			0.049 U	0.037 U	**no**	0.12U			0.044 U	0.04 U	no
Cadmium	0.676		yes	6010B	mg/kg	x	x	0.3U	0.32U			**0.053 J**	0.031 U	no	0.26U			**0.057 J**	0.042U	no	0.24U			**0.061 J**	0.032 U	**no**	0.29U			**0.054 J**	0.052 U	no
Calcium			yes	6010B	mg/kg	x	x	**267,000**	**259,000**			**180,000**	**310,000 J**	no	**225,000**			**190,000**	**410,000**	no	**232,000**			**290,000**	**330,000**	**no**	**326,000**			**310,000**	**350,000**	no
Chromium	52.3		yes	6010B	mg/kg	x	x	**5.5 J**	**14.8 J**			**1.7**	**1.7 J**	no	**3.6 J**			**2.5**	**53 J**	yes	**43.3 J**			**2.7**	**1.9 J**	**no**	**5.3 J**			**2.6**	**2.9 J**	no
Cobalt	0.48		yes	6010B	mg/kg	x	x	**0.64**	**2.0**			**0.22**	**0.53**	yes	**0.74**			**0.25**	**0.78**	yes	**1.1**			**0.30**	**0.65**	**yes**	**0.3**			**0.35**	**0.74**	yes
Copper	18.7		yes	6010B	mg/kg	x	x	**15.7 J**	**50.6 J**			**1.6 J**	**0.98**	no	**125 J**			**4.1**	**2.3**	no	**17.1 J**			**3.5**	**1.5**	**no**	**30.8 J**			**3.4**	**2.3**	no
Iron	2,398		yes	6010B	mg/kg	x	x	**3,820 J**	**22,000 J**			**130**	**81**	no	**8,930 J**			**330**	**160**	no	**11,300 J**			**150**	**120**	**no**	**2,440 J**			**200**	**180**	no
Lead	34.18		yes	6010B	mg/kg	x	x	**23.7**	**27.2**			**4.9**	**4.4 J**	no	**35**			**7.1**	**73 J**	yes	**30.2**			**9.0**	**25 J**	**no**	**103**			**8.0**	**5.4 J**	no
Magnesium			yes	6010B	mg/kg	x	x	**6,260**	**4,920**			**6,400**	**4700 J**	no	**12,400**			**4,700**	**4900**	no	**5,740**			**4,700**	**5,100**	**no**	**7,130**			**4,300**	**5,900**	no
Manganese	460		yes	6010B	mg/kg	x	x	**41.7 J**	**120 J**			**3.5**	**3.9**	no	**196 J**			**5.3**	**5**	no	**57.1 J**			**4.7**	**6.4**	**no**	**36.3 J**			**4.5**	**5.6**	no
Mercury	0.13	0.02	yes	7470A	mg/kg	x	x	**0.04**	**0.06**			**0.054 J**	0.012 U	no	**0.05**			**0.043**	0.013 U	no	**0.04**			**0.023 J**	**0.012**	**no**	**0.04**			**0.021 J**	**0.024 J**	no
Nickel	15.9		yes	6010B	mg/kg	x	x	**2.5 J**	**23.8 J**			**0.94 J**	**0.49 J**	no	**2.6 J**			**1.1**	**0.96**	no	**5.2 J**			**1.2**	0.99 U	**no**	**1.8 J**			**1.1**	**1.2**	no
Potassium			yes	6010B	mg/kg	x	x	**462**	**323**			**1,500**	**270**	no	**445**			**750**	**590**	no	**398**			**770**	**530**	**no**	**470**			**650**	**410**	no
Selenium	1.42		yes	6010B	mg/kg	x	x	0.39U	0.41U			0.85 U	0.33 U	no	0.35U			0.50 U	0.41 U	no	0.2U			0.49 U	**0.37**	**no**	0.47U			0.44 U	0.4 U	no
Silver	0.733		yes	6010B	mg/kg	x	x	0.23U	0.23U			0.17 U	0.065 U	no	0.2U			0.10 U	0.082 U	no	0.23U			0.099 U	0.075 U	**no**	0.27U			0.087 U	0.08 U	no
Sodium			yes	6010B	mg/kg	x	x	**6,960**	**5,430**			**32,000**	**8500 J**	no	**6,910**			**15,000**	**11,000**	no	**3,110**			**13,000**	9,900 U	**no**	**9,840**			**12,000**	**11,000**	no
Thallium			yes	6020	mg/kg	x	x	0.53U	0.55U			0.085 U	0.033 U	no	0.47U			0.050 U	0.041 U	no	0.27U			0.049 U	**0.037**	**no**	0.64U			0.044 U	0.04 U	no
Tin	1.98		yes	6010B	mg/kg	x		3.6U	9.9U			8.7 U	3.4 U	yes	11U			5.1 U	4.3 U	yes	3.3U			5.0 U	3.9 U	**yes**	7.1U			4.4 U	4.1 U	yes
Vanadium	10.44		yes	6010B	mg/kg	x	x	**7.7**	**6.4**			**3.9**	**1.4**	no	**7.8**			**4.6**	**3.9**	no	**6.9**			**6.6**	1.9 U	**no**	**7.1**			**7.1**	**6.2**	no
Zinc	124		yes	6010B	mg/kg	x	x	**71.6**	**73.1**			**4.3 J**	**3.3**	no	**795**			**9.5**	**69**	no	**459**			**6.9**	**4.6**	**no**	**182**			**6.0**	**3.8**	no

Inorganics	Action Level (Sediment)	PQL (Sediment)	Retained for PMP Modification Nov-12	Method	Units	App B	TAL	Location																								Retained for PMP Modification Apr-14
								I1SD-05							I1SD-06							I1SD-07							I1SD-08						
								Date Collected						Jan-14	Date Collected						Jan-14	Date Collected						Jan-14	Date Collected						Jan-14	
								Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain		Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain		Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain		Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	
Aluminum	2,664		yes	6010B	mg/kg	x	x	**861**			**48**	**80**	no		**609**			**56**	**68**	no		**585**			**87**	**61**	no		**309**			**70**	**41**	no		yes
Antimony	12		yes	6020	mg/kg	x	x	0.14U			0.81 U	0.78 U	no		0.55U			0.93 U	0.99 U	no		**2.5**			1.0 U	0.93 U	no		0.25U			0.88 U	0.89 U	no		yes
Arsenic	7.24		yes	6010B	mg/kg	x	x	**3.4 J**			**2.1**	**3.6**	no		**3 J**			**2.8**	**3.5**	no		**8.0 J**			**3.3**	**4.7**	no		2.2U			**2.1**	**2.8**	no		yes
Barium	40		yes	6010B	mg/kg	x	x	**8.6**			**7.8**	**8.9**	no		**8.5**			**7.4**	**9.2**	no		**9.7**			**19**	**9**	no		**6.4**			**7.0**	**8.6**	no		yes
Beryllium	0.1		yes	6010B	mg/kg	x	x	0.1U			0.041 U	0.039 U	no		0.1U			0.047 U	0.049 U	no		0.12U			0.050 U	0.047 U	no		0.09U			0.044 U	0.045 U	no		yes
Cadmium	0.676		yes	6010B	mg/kg	x	x	0.3U			**0.037 J**	**0.06 J**	no		0.31U			**0.026 J**	**0.055 J**	no		0.3U			**0.082 J**	0.038 U	no		0.28U			**0.056 J**	0.023 U	no		yes
Calcium			yes	6010B	mg/kg	x	x	**224,000**			**330,000**	**340,000**	no		**281,000**			**270,000**	**350,000**	no		**300,000**			**400,000**	**390,000**	no		**282,000**			**270,000**	**390,000**	no		yes
Chromium	52.3		yes	6010B	mg/kg	x	x	**3.4 J**			**2.0**	**2.4 J**	no		**4.2 J**			**1.6**	**2.1 J**	no		**8.0 J**			**3.0**	**3 J**	no		**4.7 J**			**2.2**	**1.4 J**	no		yes
Cobalt	0.48		yes	6010B	mg/kg	x	x	**0.47**			**0.39**	**0.76**	yes		**0.21**			**0.32**	**0.76**	yes		**1.6**			**0.50**	**0.77**	yes		**0.18**			**0.32**	**0.85**	yes		yes
Copper	18.7		yes	6010B	mg/kg	x	x	**45.7 J**			**1.4**	**1.8**	no		**30.2 J**			**1.2**	**1.8**	no		**78.1 J**			**2.4**	**1.7**	no		**24.7 J**			**1.5**	**0.74 J**	no		yes
Iron	2,398		yes	6010B	mg/kg	x	x	**2,680 J**			**110**	**190**	no		**1,830 J**			**110**	**140**	no		**2,620 J**			**150**	**150**	no		**748 J**			**130**	**140**	no		yes
Lead	34.18		yes	6010B	mg/kg	x	x	**80.7**			**2.9**	**4.9 J**	no		**52.5**			**3.4**	**4.4 J**	no		**119**			**3.9**	**18 J**	no		**222**			**2.7**	**2 J**	no		yes
Magnesium			yes	6010B	mg/kg	x	x	**5,690**			**4,700**	**6,100**	no		**6,300**			**4,800**	**5,500**	no		**6,640**			**6,800**	**5,500**	no		**3,970**			**4,900**	**4,700**	no		yes
Manganese	460		yes	6010B	mg/kg	x	x	**56.9 J**			**4.5**	**6.2**	no		**26.4 J**			**4.3**	**5.5**	no		**23.6 J**			**6.4**	**5.4**	no		**21.9 J**			**4.6**	**4.8**	no		yes
Mercury	0.13	0.02	yes	7470A	mg/kg	x	x	**0.08**			**0.017 J**	**0.024 J**	no		**0.11**			**0.022 J**	**0.016**	no		**0.06**			0.017 U	**0.015**	no		**0.03**			0.015 U	0.015 U	no		yes
Nickel	15.9		yes	6010B	mg/kg	x	x	**1.4 J**			**0.70 J**	**1.6**	no		**1.4 J**			**0.79 J**	1.1 U	no		**2.8 J**			**1.7**	0.81 U	no		**0.82 J**			**0.93 J**	**0.71 J**	no		yes
Potassium			yes	6010B	mg/kg	x	x	**559**			**420**	**620**	no		**505**			**700**	**710**	no		**355**			**870**	**760 J**	no		**349**			**690**	**480**	no		yes
Selenium	1.42		yes	6010B	mg/kg	x	x	0.25U			0.41 U	0.39 U	no		0.25U			0.47 U	**0.49**	no		0.5U			0.50 U	**0.47**	no		0.45U			0.44 U	0.45 U	no		yes
Silver	0.733		yes	6010B	mg/kg	x	x	0.28U			0.081 U	0.078 U	no		0.29U			0.093 U	0.099 U	no		0.29U			0.10 U	0.093 U	no		0.26U			0.088 U	0.089 U	no		yes
Sodium			yes	6010B	mg/kg	x	x	**6,260**			**9,800**	**11,000**	no		**7,980**			**12,000**	15,000 U	no		**6,240**			**13,000**	13,000 U	no		**6,540**			**14,000**	**11,000**	no		yes
Thallium			yes	6020	mg/kg	x	x	0.33U			0.041 U	0.039 U	no		0.34U			0.047 U	**0.049**	no		0.67U			0.050 U	**0.047**	no		0.61U			0.044 U	0.045 U	no		yes
Tin	1.98		yes	6010B	mg/kg	x		3U			4.1 U	4.1 U	yes		3.2U			4.7 U	5.1 U	yes		11.3U			5.1 U	4.8 U	yes		2.8U			4.5 U	4.6 U	yes		yes
Vanadium	10.44		yes	6010B	mg/kg	x	x	**8**			**2.6**	**3.9**	no		**5.8**			**2.3**	4.8 U	no		**6.0**			**5.8**	3.4 U	no		**3.8**			**4.5**	**1.9**	no		yes
Zinc	124		yes	6010B	mg/kg	x	x	**45**			**2.3 J**	**6.5**	no		**54.3**			**3.6 J**	**5**	no		**104**			**4.9**	**5.2**	no		**33.5**			**3.6**	**2.8 J**	no		yes

Not a Target Analyte List (TAL) Metal

Reporting limit above Action level

Compound retained during optimization analysis

Action Level and Appendix B (App B) Compounds (B&RE, 1998)

Detected below Action level

Detected above Action level

No Available Data

Target Analyte List (TAL) Compounds (B&RE, 1998)

Qualifiers:
J - Estimated concentration.
U - Non-detect, Reporting limit listed.

Table 30. IR-1 Sediment Polycyclic Aromatic Hydrocarbons

SVOCs	Action Level (Sediment)	PQL (Sediment)	Retained for PMP Mod Nov-12	Method	Units	App B	TCL	Location I1SD-01 Date Collected Jan-03	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Jan-14 Retain	Location I1SD-02 Date Collected Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Jan-14 Retain	Location I1SD-03 Date Collected Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Jan-14 Retain	Location I1SD-04 Date Collected Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Jan-14 Retain
1-Methylnaphthalene			yes	8270C	µg/kg			450UR	440UR			**38**	4.7 U	no	430UR			7.0 U	**21**	no	390UR			**22**	53 U	no	530UR			**24**	5.3 UJ	no
2-Methylnaphthalene	20.2		yes	8270C	µg/kg	x	x	450U	440U			**69**	4.7 U	yes	430U			7.0 U	**34**	yes	390U			**28**	53 U	yes	530U			**37**	5.3 UJ	yes
Acenaphthene	6.71		yes	8270C	µg/kg	x	x	**100 J**	440U			**140**	**18**	yes	430U			**11 J**	**150**	yes	390U			**220**	53 U	yes	530U			**10 J**	5.3 UJ	yes
Acenaphthylene	5.87		yes	8270C	µg/kg	x	x	450U	440U			13 U	4.7 U	no	430U			7.0 U	5.6 U	yes	390U			6.6 U	53 U	yes	530U			6.2 U	5.3 UJ	yes
Anthracene	46.9		yes	8270C	µg/kg	x	x	**180 J**	**33 J**			**290 J**	**55**	yes	430U			**22 J**	**300**	yes	390U			**410 J**	**110**	yes	**100 J**			**7.5 J**	**12 J**	no
Benzo[a]anthracene	74.8		yes	8270C	µg/kg	x	x	**450 J**	**100 J**			**850 M**	**120 J**	yes	**210 J**			**77 M**	**770**	yes	**40 J**			**960**	**310 J**	yes	**430 J**			6.2 U	**29 J**	no
Benzo[a]pyrene	88.8		yes	8270C	µg/kg	x	x	**360 J**	**120 J**			**770**	**98 J**	yes	**160 J**			**70**	**570**	yes	390U			**890**	**210**	yes	**290 J**			**5.1 J**	**25 J**	no
Benzo[b]fluoranthene	3,200		yes	8270C	µg/kg	x	x	**490 J**	**150 J**			**1,100 M**	**110 J**	no	**240 J**			**110 M**	**860**	no	390U			**1,200 M**	**250**	no	**450 J**			**7.6 J**	**26 J**	no
Benzo[g,h,i]perylene	670		yes	8270C	µg/kg	x	x	**200 J**	**67 J**			**230**	**49 J**	no	**100 J**			**22**	**240**	no	390U			**290**	**120**	no	**140 J**			6.2 U	**15 J**	no
Benzo[k]fluoranthene	14,000		yes	8270C	µg/kg	x	x	**250 J**	**74 J**			**420 M**	**65**	no	**120 J**			**48 M**	**470**	no	390U			**500 M**	**190**	no	**180 J**			6.2 U	**20 J**	no
Chrysene	106		yes	8270C	µg/kg	x	x	**530 J**	**120 J**			**810**	**100 J**	yes	**230 J**			**72**	**710**	yes	**39 J**			**870**	**330**	yes	**480 J**			6.2 U	**26 J**	no
Dibenzo[a,h]anthracene	6.22		yes	8270C	µg/kg	x	x	450U	440U			**31**	**19**	yes	430U			**9.5 J**	**93**	yes	390U			**110**	53 U	yes	530U			6.2 U	**7.3 J**	yes
Fluoranthene	113		yes	8270C	µg/kg	x	x	**890 J**	**210 J**			**1,600**	**270 J**	yes	**350 J**			**150**	**1000**	yes	**46 J**			**1,100**	**690**	yes	**800**			**7.1 J**	**51 J**	no
Fluorene	19		yes	8270C	µg/kg	x	x	**66 J**	440U			**140**	**20**	yes	430U			**10 J**	**130**	yes	390U			**240**	53 U	yes	530U			6.2 U	5.3 UJ	no
Indeno[1,2,3-cd]pyrene	600		yes	8270C	µg/kg	x	x	**250 J**	**70 J**			**200**	**54 J**	no	**100 J**			**19**	**280**	no	390U			**220**	**97 J**	no	**180 J**			6.2 U	**11 J**	no
Naphthalene	34.6		yes	8270C	µg/kg	x	x	**26 J**	440U			13 U	4.7 U	no	430U			7.0 U	**28**	no	390U			**18**	53 U	yes	530U			6.2 U	5.3 UJ	no
Phenanthrene	86.7		yes	8270C	µg/kg	x	x	**710 J**	**110 J**			**990**	**170 J**	yes	**88 J**			**94**	**790**	yes	390U			**1,100**	**270**	yes	**410 J**			**7.6 J**	**29 J**	no
Pyrene	153		yes	8270C	µg/kg	x	x	**850 J**	**180 J**			**1,600**	**200 J**	yes	**320 J**			**140**	**880**	yes	**42 J**			**1,300**	**570**	yes	**870**			**7.8 J**	**44 J**	no

SVOCs	Action Level (Sediment)	PQL (Sediment)	Retained for PMP Mod Nov-12	Method	Units	App B	TCL	Location I1SD-05 Date Collected Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Jan-14 Retain	Location I1SD-06 Date Collected Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Jan-14 Retain	Location I1SD-07 Date Collected Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Jan-14 Retain	Location I1SD-08 Date Collected Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Jan-14 Retain	Retained for PMP Modification Apr-14
1-Methylnaphthalene			yes	8270C	µg/kg			440UR			5.5 U	5.7 U J	no	500UR			6.1 U	6.6 U	no	460UR			7.1 U	**6.8 J**	no	450UR			**14**	5.9 U	no	yes
2-Methylnaphthalene	20.2		yes	8270C	µg/kg	x	x	440U			5.5 U	5.7 UJ	no	500U			6.1 U	6.6 U	no	460U			7.1 U	**6.6 J**	no	450U			**32**	5.9 U	yes	yes
Acenaphthene	6.71		yes	8270C	µg/kg	x	x	**23 J**			5.5 U	5.7 UJ	no	500U			6.1 U	6.6 U	no	460U			7.1 U	**92**	yes	**77 J**			6.3 U	5.9 U	no	yes
Acenaphthylene	5.87		yes	8270C	µg/kg	x	x	440U			5.5 U	5.7 UJ	no	500U			6.1 U	6.6 U	yes	460U			7.1 U	6.3 U	yes	450U			6.3 U	5.9 U	no	yes
Anthracene	46.9		yes	8270C	µg/kg	x	x	**130 J**			5.5 UJ	5.7 UJ	no	500U			**7.0 J**	**7 J**	no	**27 J**			7.1 UJ	**170**	yes	**180 J**			6.3 UJ	5.9 U	no	yes
Benzo[a]anthracene	74.8		yes	8270C	µg/kg	x	x	**540**			**18**	**7.8 J**	no	**61 J**			**25 M**	**27**	no	**120 J**			7.1 U	**370**	yes	**820**			6.3 U	5.9 U	no	yes
Benzo[a]pyrene	88.8		yes	8270C	µg/kg	x	x	**570**			**13**	**7.9 J**	no	500U			**23**	**23**	no	**120 J**			7.1 U	**340**	yes	**650**			**4.3 J**	5.9 U	no	yes
Benzo[b]fluoranthene	3,200		yes	8270C	µg/kg	x	x	**680**			**19**	**8.8 J**	no	**78 J**			**34 M**	**30**	no	**160 J**			7.1 U	**410**	no	**950**			6.3 U	5.9 U	no	yes
Benzo[g,h,i]perylene	670		yes	8270C	µg/kg	x	x	**300 J**			5.5 U	**6.2 J**	no	500U			**11 J**	**13**	no	**54 J**			7.1 U	**160**	no	**270 J**			6.3 U	5.9 U	no	yes
Benzo[k]fluoranthene	14,000		yes	8270C	µg/kg	x	x	**340 J**			**7.6 J**	**5.6 J**	no	500U			**11 J**	**18**	no	**110 J**			7.1 U	**250**	no	**430 J**			6.3 U	5.9 U	no	yes
Chrysene	106		yes	8270C	µg/kg	x	x	**780**			**18**	**7.5 J**	no	**67 J**			23	**25**	no	**130 J**			7.1 U	**330**	yes	**770**			6.3 U	5.9 U	no	yes
Dibenzo[a,h]anthracene	6.22		yes	8270C	µg/kg	x	x	**98 J**			5.5 U	5.7 UJ	no	500U			6.1 U	**8 J**	yes	460U			**7.1 U**	**52**	yes	**92 J**			6.3 U	5.9 U	no	yes
Fluoranthene	113		yes	8270C	µg/kg	x	x	**970**			**36**	**13 J**	no	**110 J**			**45**	**46**	no	**220 J**			7.1 U	**710**	yes	**1600**			**6.9 J**	5.9 U	no	yes
Fluorene	19		yes	8270C	µg/kg	x	x	440U			5.5 U	5.7 UJ	no	500U			6.1 U	**8.1 J**	no	460U			7.1 U	**91**	yes	**49 J**			6.3 U	5.9 U	no	yes
Indeno[1,2,3-cd]pyrene	600		yes	8270C	µg/kg	x	x	**340 J**			5.5 U	5.7 UJ	no	500U			**9.9 J**	**7.2 J**	no	**57 J**			7.1 U	**170**	no	**300 J**			6.3 U	5.9 U	no	yes
Naphthalene	34.6		yes	8270C	µg/kg	x	x	440U			5.5 U	5.7 UJ	no	500U			6.1 U	6.6 U	no	460U			**310**	6.3 U	yes	450U			6.3 U	5.9 U	no	yes
Phenanthrene	86.7		yes	8270C	µg/kg	x	x	**330 J**			**17**	**7.6 J**	no	**69 J**			**28**	**23**	no	**160 J**			7.1 U	**550**	yes	**600**			**5.1 J**	5.9 U	no	yes
Pyrene	153		yes	8270C	µg/kg	x	x	**930**			**32**	**11 J**	no	**130 J**			**40**	**40**	no	**220 J**			7.1 U	**630**	yes	**1500**			**7.2 J**	5.9 U	no	yes

Not an Appendix IX or Appendix B Compound
Detected below Action level
Reporting limit above Action level
Detected above Action level
Compound retained during optimization analysis
No Available Data
Action Level and Appendix B (App B) Compounds identified in B&RE (1998)
Target Compound List (TCL) from U.S. EPA

Qualifiers:
J - Estimated concentration.
U - Analyte was not detected above the method detection limit; Reporting limit is listed.
UR - Analyte was not detected above the method detection limit; Analytical result is rejected.
M - Manually integrated analyte

Table 31. IR-1 Sediment Pesticides and Polychlorinated Biphenyls (PCBs)

Pesticides/PCBs	Action Level (Sediment)	PQL (Sediment)	Retained for PMP Mod Nov-12	Method	Units	App B	TCL	Location																							
								I1SD-01							I1SD-02							I1SD-03							I1SD-04						
								Date Collected						Jan-14	Date Collected						Jan-14	Date Collected						Jan-14	Date Collected						Jan-14
								Jan-03	Jan-03 Dup	Oct-10	Dec-11	Dec-12	Dec-13	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain
PCB-1016	22.7	40	yes	8081A	µg/kg	x	x	230U	23U			25 UJ	46 UJ	yes	220U			14 U	56 UJ	yes	20U			13 U	110 U	yes	27U			12 UJ	54 U	yes
PCB-1221	22.7	40	yes	8081A	µg/kg	x	x	230U	23U			25 UJ	46 UJ	yes	220U			14 U	56 UJ	yes	20U			13 U	110 U	yes	27U			12 UJ	54 U	yes
PCB-1232	22.7	40	yes	8081A	µg/kg	x	x	230U	23U			12 UJ	23 UJ	yes	220U			6.9 U	28 UJ	no	20U			6.5 U	52 U	yes	27U			6.1 UJ	26 U	no
PCB-1242	22.7	40	yes	8081A	µg/kg	x	x	230U	23U			25 UJ	46 UJ	yes	220U			14 U	56 UJ	yes	20U			13 U	110 U	yes	27U			12 UJ	54 U	yes
PCB-1248	22.7	40	yes	8081A	µg/kg	x	x	230U	23U			27 UJ	50 UJ	yes	220U			15 U	61 UJ	yes	20U			14 U	110 U	yes	27U			13 UJ	58 U	yes
PCB-1254	22.7	40	yes	8081A	µg/kg	x	x	230U	**400**			12 UJ	23 UJ	yes	220U			6.9 U	28 UJ	no	20U			6.5 U	52 U	yes	27U			6.1 UJ	26 U	no
PCB-1260	22.7	40	yes	8081A	µg/kg	x	x	**11,000 J**	**2200 J**			**120 J**	46 UJ	yes	**5,600**			**82 J**	56 UJ	yes	**1,500**			**42 J**	110 U	yes	**4,600**			12 UJ	54 U	yes
4,4'-DDD	1.78		yes	8081A	µg/kg	x	x	23U	4.4U			1.2 UJ	2.3 UJ	yes	8.6U			0.69 U	2.8 UJ	yes	3.9U			0.65 U	5.2 U	yes	5.3U			0.61 UJ	2.6 U	yes
4,4'-DDE	2.07		yes	8081A	µg/kg	x	x	23U	**22**			1.2 UJ	2.3 UJ	yes	**46**			0.69 U	2.8 UJ	yes	**25**			**0.53 J**	5.2 U	yes	**79**			0.61 UJ	2.6 U	yes
4,4'-DDT	1.76		yes	8081A	µg/kg	x	x	23UJ	4.4U			1.2 UJ	2.3 UJ	yes	8.6UJ			**3.4 J**	2.8 UJ	yes	3.9U			0.65 UJ	5.2 U	yes	5.3U			0.61 UJ	2.6 U	yes
Aldrin	60		yes	8081A	µg/kg	x	x	12U	2.3U			1.7 UJ	3.1 UJ	no	4.4U			0.95 U	3.8 UJ	no	2.0U			0.88 U	7.2 U	no	2.7U			0.83 UJ	3.6 U	no
alpha-BHC	1.05	2	yes	8081A	µg/kg	x	x	12U	2.3U			0.64 UJ	1.2 UJ	no	4.4U			0.36 U	1.4 UJ	no	2.0U			0.33 U	2.7 U	yes	2.7U			0.32 UJ	1.4 U	no
beta-BHC	5	2	yes	8081A	µg/kg	x	x	12U	**2.3**			1.2 UJ	2.3 UJ	no	4.4U			0.69 U	2.8 UJ	no	2.0U			0.65 U	5.2 U	yes	2.7U			0.61 UJ	2.6 U	no
Chlordane (technical)	490		yes	8081A	µg/kg	x	x	12U	2.3U			11 UJ	20 UJ	no	4.4U			6.1 U	24 UJ	no	2.0U			5.7 U	46 U	no	2.7U			5.4 UJ	23 U	no
delta-BHC	3		yes	8081A	µg/kg	x	x	12U	2.3U			0.64 UJ	1.2 UJ	no	4.4U			0.36 U	1.4 UJ	no	2.0U			0.33 U	2.7 U	no	2.7U			0.32 UJ	1.4 U	no
Dieldrin	0.715	3	yes	8081A	µg/kg	x	x	**410**	**34**			1.2 UJ	2.3 UJ	no	8.6U			0.69 U	2.8 UJ	no	3.9U			0.65 U	5.2 U	yes	5.3U			0.61 UJ	2.6 U	no
Endosulfan I	2.9	4	yes	8081A	µg/kg	x	x	12U	2.3U			0.64 UJ	1.2 UJ	no	4.4U			0.36 U	1.4 UJ	no	2.0U			0.33 U	2.7 U	no	2.7U			0.32 UJ	1.4 U	no
Endosulfan II	14	4	yes	8081A	µg/kg	x	x	23U	4.4U			1.2 UJ	2.3 UJ	no	8.6U			0.69 U	2.8 UJ	no	3.9U			0.65 U	5.2 U	no	5.3U			0.61 UJ	2.6 U	no
Endosulfan sulfate		4	yes	8081A	µg/kg	x	x	23U	4.4U			1.2 UJ	2.3 UJ	no	8.6U			0.69 U	2.8 UJ	no	3.9U			0.65 U	5.2 U	no	5.3U			0.61 UJ	2.6 U	no
Endrin	3.3	5	yes	8081A	µg/kg	x	x	23U	**15**			2.8 UJ	5.1 UJ	yes	8.6U			1.5 U	6.1 UJ	yes	**14**			1.4 U	12 U	yes	**36**			1.4 UJ	5.9 U	yes
Endrin aldehyde	23,000		yes	8081A	µg/kg	x	x	23U	4.4U			1.3 UJ	2.4 UJ	no	8.6U			0.71 U	2.9 UJ	no	3.9U			0.67 U	5.4 U	no	5.3U			0.63 UJ	2.7 U	no
Endrin ketone			yes	8081A	µg/kg	x	x	23UJ	4.4U			1.2 UJ	2.3 UJ	no	8.6UJ			0.69 U	2.8 UJ	no	3.9U			0.65 U	5.2 U	no	5.3U			0.61 UJ	2.6 U	no
gamma-BHC (Lindane)	1.22		yes	8081A	µg/kg	x	x	12U	**1.2 J**			0.64 UJ	1.2 UJ	no	**3.7 J**			0.36 U	1.4 UJ	yes	**0.87 J**			0.33 U	2.7 U	yes	2.7U			0.32 UJ	1.4 U	yes
Heptachlor	4.9		yes	8081A	µg/kg	x	x	12U	2.3U			0.64 UJ	1.2 UJ	no	4.4U			0.36 U	1.4 UJ	no	2.0U			0.33 UJ	2.7 U	no	2.7U			0.32 UJ	1.4 U	no
Heptachlor epoxide	300	2	yes	8081A	µg/kg	x	x	12U	2.3U			0.64 UJ	1.2 UJ	no	4.4U			0.36 U	1.4 UJ	no	2.0U			0.33 U	2.7 U	no	**9.8**			0.32 UJ	1.4 UJ	no
Methoxychlor	19		yes	8081A	µg/kg	x	x	120UJ	23U			1.3 UJ	2.4 UJ	no	44UJ			0.74 U	2.9 UJ	no	20U			0.69 UJ	5.6 U	no	27U			0.65 UJ	2.8 U	no
Toxaphene	28	100	yes	8081A	µg/kg	x	x	230U	44U			230 UJ	420 UJ	yes	86U			130 U	500 UJ	yes	39U			120 U	950 U	yes	53U			110 UJ	480 U	yes

Pesticides/PCBs	Action Level (Sediment)	PQL (Sediment)	Retained for PMP Mod Nov-12	Method	Units	App B	TCL	Location																								Retained for PMP Modification Apr-14
								I1SD-05							I1SD-06							I1SD-07							I1SD-08							
								Date Collected						Jan-14	Date Collected						Jan-14	Date Collected						Jan-14	Date Collected						Jan-14	
								Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain		Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain		Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain		Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain		
PCB-1016	22.7	40	yes	8081A	µg/kg	x	x	22U			11 UJ	58 U	yes		26U			12 U	66 U	yes		24U			14 U	65 U	yes		23U			13 U	59 U	yes		yes
PCB-1221	22.7	40	yes	8081A	µg/kg	x	x	22U			11 UJ	58 U	yes		26U			12 U	66 U	yes		24U			14 U	65 U	yes		23U			13 U	59 U	yes		yes
PCB-1232	22.7	40	yes	8081A	µg/kg	x	x	22U			5.5 UJ	29 U	no		26U			6.0 U	32 U	no		24U			6.9 U	32 U	no		23U			6.2 U	29 U	no		yes
PCB-1242	22.7	40	yes	8081A	µg/kg	x	x	22U			11 UJ	58 U	yes		26U			12 U	66 U	yes		24U			14 U	65 U	yes		23U			13 U	59 U	yes		yes
PCB-1248	22.7	40	yes	8081A	µg/kg	x	x	22U			12 UJ	62 U	yes		26U			13 U	71 U	yes		24U			15 U	70 U	yes		23U			14 U	63 U	yes		yes
PCB-1254	22.7	40	yes	8081A	µg/kg	x	x	**240**			5.5 UJ	29 U	no		**210**			6.0 U	32 U	no		**130**			6.9 U	32 U	no		**59**			6.2 U	29 U	no		yes
PCB-1260	22.7	40	yes	8081A	µg/kg	x	x	**280**			11 UJ	58 U	yes		**170**			12 U	66 U	yes		**85**			14 U	65 U	yes		**100**			13 U	59 U	yes		yes
4,4'-DDD	1.78		yes	8081A	µg/kg	x	x	4.4U			0.55 UJ	2.9 U	yes		5.0U			0.60 U	3.2 U	yes		**16**			0.69 U	3.2 U	yes		**7.6**			0.62 U	2.9 U	yes		yes
4,4'-DDE	2.07		yes	8081A	µg/kg	x	x	**20**			0.55 UJ	2.9 U	yes		**20**			0.60 U	3.2 U	yes		**28**			0.69 U	3.2 U	yes		**20**			0.62 U	2.9 U	yes		yes
4,4'-DDT	1.76		yes	8081A	µg/kg	x	x	4.4U			0.55 UJ	2.9 U	yes		5.0U			0.60 U	3.2 U	yes		**21**			0.69 U	3.2 U	yes		**8.8**			0.62 U	2.9 U	yes		yes
Aldrin	60		yes	8081A	µg/kg	x	x	2.2U			0.74 UJ	3.9 U	no		2.6U			0.82 U	4.4 U	no		2.4U			0.94 U	4.4 U	no		2.3U			0.85 U	4 U	no		yes
alpha-BHC	1.05	2	yes	8081A	µg/kg	x	x	2.2U			0.28 UJ	1.5 U	no		2.6U			0.31 U	1.7 U	no		2.4U			0.36 U	1.6 U	no		2.3U			0.32 U	1.5 U	no		yes
beta-BHC	5	2	yes	8081A	µg/kg	x	x	2.2U			0.55 UJ	2.9 U	no		2.6U			0.60 U	3.2 U	no		2.4U			0.69 U	3.2 U	no		2.3U			0.62 U	2.9 U	no		yes
Chlordane (technical)	490		yes	8081A	µg/kg	x	x	2.2U			4.8 UJ	25 U	no		2.6U			5.3 U	29 UJ	no		2.4U			6.1 U	28 U	no		2.3U			5.5 U	26 U	no		yes
delta-BHC	3		yes	8081A	µg/kg	x	x	2.2U			0.28 UJ	1.5 U	no		2.6U			0.31 U	1.7 U	no		2.4U			0.36 U	1.6 U	no		2.3U			0.32 U	1.5 U	no		yes
Dieldrin	0.715	3	yes	8081A	µg/kg	x	x	4.4U			0.55 UJ	2.9 U	no		5.0U			0.60 U	3.2 U	yes		**4.3 J**			0.69 U	3.2 U	yes		4.5U			0.62 U	2.9 U	no		yes
Endosulfan I	2.9	4	yes	8081A	µg/kg	x	x	2.2U			0.28 UJ	1.5 U	no		2.6U			0.31 U	1.7 U	no		2.4U			0.36 U	1.6 U	no		2.3U			0.32 U	1.5 U	no		yes
Endosulfan II	14	4	yes	8081A	µg/kg	x	x	4.4U			0.55 UJ	2.9 U	no		5.0U			0.60 U	3.2 U	no		4.6U			0.69 U	3.2 U	no		4.5U			0.62 U	2.9 U	no		yes
Endosulfan sulfate		4	yes	8081A	µg/kg	x	x	4.4U			0.55 UJ	2.9 U	no		5.0U			0.60 U	3.2 U	no		4.6U			0.69 U	3.2 U	no		4.5U			0.62 U	2.9 U	no		yes
Endrin	3.3	5	yes	8081A	µg/kg	x	x	**2.9 J**			1.2 UJ	6.3 U	yes		**3.3 J**			1.3 U	7.2 U	yes		**4.3 J**			1.5 U	7.1 U	yes		4.5U			1.4 U	6.4 U	yes		yes
Endrin aldehyde	23,000		yes	8081A	µg/kg	x	x	4.4U			0.56 UJ	2.9 U	no		5.0U			0.62 U	3.3 U	no		4.6U			0.71 U	3.3 U	no		4.5U			0.64 U	3 U	no		yes
Endrin ketone			yes	8081A	µg/kg	x	x	4.4U			0.55 UJ	2.9 U	no		5.0U			0.60 U	3.2 U	no		4.6U			0.69 U	3.2 U	no		4.5U			0.62 U	2.9 U	no		yes

Table 31. IR-1 Sediment Pesticides and Polychlorinated Biphenyls (PCBs) (Continued)

Pesticides/PCBs	Action Level (Sediment)	PQL (Sediment)	Retained for PMP Mod Nov-12	Method	Units	App B	TCL	Location												Location												Retained for PMP Modification Apr-14
								I1SD-05						I1SD-06						I1SD-07						I1SD-08						
								Date Collected					Jan-14	Date Collected					Jan-14	Date Collected					Jan-14	Date Collected					Jan-14	
								Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Retain	
gamma-BHC (Lindane)	1.22		yes	8081A	µg/kg	x	x	2.2U			0.28 UJ	1.5 U	yes	**1.4 J**			0.31 U	1.7 U	**yes**	2.4U			0.36 U	1.6 U	yes	2.3U			0.32 U	1.5 U	**yes**	**yes**
Heptachlor	4.9		yes	8081A	µg/kg	x	x	**1.8 J**			0.28 UJ	1.5 U	no	**1.3 J**			0.31 U	1.7 U	**no**	2.4U			0.36 U	1.6 U	no	2.3U			0.32 U	1.5 U	**no**	**yes**
Heptachlor epoxide	300	2	yes	8081A	µg/kg	x	x	2.2U			0.28 UJ	1.5 U	no	2.6U			0.31 U	1.7 U	**no**	**1.6 J**			0.36 U	1.6 U	no	2.3U			0.32 U	1.5 U	**no**	**yes**
Methoxychlor	19		yes	8081A	µg/kg	x	x	22U			0.58 UJ	3 U	no	26U			0.64 U	3.4 U	**no**	24U			0.73 U	3.4 U	no	23U			0.66 U	3.1 U	**no**	**yes**
Toxaphene	28	100	yes	8081A	µg/kg	x	x	44U			99 UJ	520 U	yes	50U			110 UJ	590 UJ	**yes**	46U			130 UJ	580 U	yes	45U			110 UJ	530 U	**yes**	**yes**

Detected below Action level

Reporting limit above Action level

Reporting limit above Action level but below PQL

Detected above Action level

Compound retained during optimization analysis

No Available Data

Action Level and Appendix B (App B) Compounds identified in B&RE (1998)

Target Compound List (TCL) from U.S. EPA

Qualifiers:

J - Estimated concentration.

U - Analyte was not detected above the method detection limit; Reporting limit is listed..

UJ - Analyte was not detected above the method detection limit; Reporting limit is estimated.

Table 32. IR-7 Groundwater Metals

Inorganics	Action Level (Groundwater)	PQL (Ground-water)	Action Level (Surface Water)	PQL (Surface Water)	Retained for PMP Modification Nov-12	Method	Units	App B	TAL	Location I7MW7-3 Date Collected Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Jan-14 Retain	Retained for PMP Modification Apr-14
Aluminum	37,000		1,500		no	**6010B**	**µg/L**	**x**	**x**	21.8U	100U	500U			no	no
Antimony	6		4,300		yes	**6020**	**µg/L**	**x**	**x**	6.0U	2.0U		2.0 U	2 U	no	yes
Arsenic	50		50		yes	**6010B**	**µg/L**	**x**	**x**	**45.7**	**34**	**27 D**	**22**	6.5 U	no	yes
Barium	2,000		10,000		no	**6010B**	**µg/L**	**x**	**x**	**44.1**	**40**				no	no
Beryllium	4		0.28		yes	**6010B**	**µg/L**	**x**	**x**	0.60U	0.20U		0.25 U	0.25 U	no	yes
Cadmium	5		9.3		no	**6010B**	**µg/L**	**x**	**x**	0.75U	2.0U				no	no
Calcium					no	**6010B**	**µg/L**	**x**	**x**	**424,000**	**300,000**				no	no
Chromium	100		50		no	**6010B**	**µg/L**	**x**	**x**	**42.9**	**6.4 J**				no	no
Cobalt	2,200		35,000		no	**6010B**	**µg/L**	**x**	**x**	2.8U	2.0U				no	no
Copper	1,500		2.9		yes	**6010B**	**µg/L**	**x**	**x**	5.7U	2.0U		1.1 U	5.5 U	yes	yes
Iron	11,000		300		yes	**6010B**	**µg/L**	**x**	**x**	**118**	**350**	440U	**460**	44 U	yes	yes
Lead	15		5.6		no	**6010B**	**µg/L**	**x**	**x**	4.4U	4.0U				no	no
Magnesium					no	**6010B**	**µg/L**	**x**	**x**	**1,280,000**	**1,000,000 D**				no	no
Manganese	840		10		yes	**6010B**	**µg/L**	**x**	**x**	**97.6**	**19**	20U	**19**	**35**	yes	yes
Mercury	2		1.26		no	**7470A**	**µg/L**	**x**	**x**	0.08U	0.10U				no	no
Nickel	100		8.3		no	**6010B**	**µg/L**	**x**	**x**	3.2U	4.0U				no	no
Potassium					no	**6010B**	**µg/L**	**x**	**x**	**447,000**	**330,000 D**				no	no
Selenium	50		71		no	**6010B**	**µg/L**	**x**	**x**	10.6U	8.0U				no	no
Silver	180		2.3		yes	**6010B**	**µg/L**	**x**	**x**	2.5U	**1.0 J**		0.25 U	0.25 U	no	yes
Sodium	160,000				no	**6010B**	**µg/L**	**x**	**x**	**9,380,000**	**8,800,000 D**				no	no
Thallium	4.62		7.3		yes	**6020**	**µg/L**	**x**	**x**	18.0U	0.25U	2.5U	0.25 U	0.25 U	no	yes
Tin	22,000		0.01		yes	**6010B**	**µg/L**	**x**		10.0U			1.4 U	1.4 U	yes	yes
Vanadium	260		10,000		no	**6010B**	**µg/L**	**x**	**x**	1.7U	2.4U				no	no
Zinc	11,000		86		no	**6010B**	**µg/L**	**x**	**x**	**3.8**	**15.0 J**				no	no

Not a Target Analyte List (TAL) Metal

Detected below lowest Action level

Reporting limit above Action level

Detected above Surface Water Action level

Detected above Groundwater Action level

Compound retained during optimization analysis

* Sodium concentrations reflect seawater values (i.e., near 10,700,000 µg/L)

No Available Data

Action Level and Appendix B (App B) Compounds (B&RE, 1998)

Target Analyte List (TAL) Compounds (B&RE, 1998)

Qualifiers:

D - Dilution Result.

J - Estimated concentration.

U - Non-detect, Reporting limit listed.

Table 33. IR-8 Groundwater Metals

Inorganics	Action Level (Groundwater)	PQL (Ground-water)	Action Level (Surface Water)	PQL (Surface Water)	Retained for PMP Modification Nov-12	Method	Units	App B	TAL	Location I8MW8-01 Date Collected Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Jan-14 Retain	Location I8MW8-02 Date Collected Jan-03	Oct-10	Dec-11	Dec-12	Dec-13	Jan-14 Retain	Retained for PMP Modification Apr-14
Aluminum	37,000		1,500		no	6010B	µg/L	x	x	**96.3U**	**100U**	**500U**				**124**	**100U**	**500U**			no	no
Antimony	6		4,300		yes	6020	µg/L	x	x	3.6U	2.0U	20U	2.0 U	2 U	no	17.2U	**5.5 D**	20U	**20**	**4.4 J**	yes	yes
Arsenic	50		50		yes	6010B	µg/L	x	x	**5.5**	**8.5 J**	**17 JD**	**2.1 J**	**14**	no	**53.1**	**16 J**	13U	**12**	6.5 U	no	yes
Barium	2,000		10,000		no	6010B	µg/L	x	x	**110**	**200**					**90.7**	**89**				no	no
Beryllium	4		0.28		yes	6010B	µg/L	x	x	1.6U	0.20U		0.25 U	0.25 U	no	1.6U	0.20U		0.25 U	0.25 U	no	yes
Cadmium	5		9.3		yes	6010B	µg/L	x	x	13.0U	2.0U		0.20 U	0.2 U	no	13.0U	2.0U		**0.16 J**	0.2 U	no	yes
Calcium					no	6010B	µg/L	x	x	**238,000**	**270,000**					**514,000**	**370,000**				no	no
Chromium	100		50		no	6010B	µg/L	x	x	1.8U	2.0U					7.1U	2.0U				no	no
Cobalt	2,200		35,000		no	6010B	µg/L	x	x	1.7U	2.0U					1.7U	2.0U				no	no
Copper	1,500		2.9		yes	6010B	µg/L	x	x	11.9U	2.0U		1.1 U	1.1 U	no	11.9U	**2.1 J**		1.1 U	5.5 U	yes	yes
Iron	11,000		300		yes	6010B	µg/L	x	x	23.7U	**320**	440U	**80 J**	44 U	no	159U	**190**	440U	**160**	**61 J**	no	yes
Lead	15		5.6		no	6010B	µg/L	x	x	2.6U	4.0U					2.6U	4.0U				no	no
Magnesium					no	6010B	µg/L	x	x	**1,020,000**	**750,000 D**					**1,400,000**	**1,000,000 D**				no	no
Manganese	840		10		yes	6010B	µg/L	x	x	**20.2**	**66**	**64 D**	**55**	**37**	yes	2.9U	**16**	20U	**23**	**25**	yes	yes
Mercury	2		1.26		no	7470A	µg/L	x	x	0.09U	0.10U					0.09U	0.10U				no	no
Nickel	100		8.3		yes	6010B	µg/L	x	x	50.9U	4.0U		**5.8**	2 U	no	50.9U	4.0U		2.0 U	10 U	yes	yes
Potassium					no	6010B	µg/L	x	x	**355,000**	**270,000 D**					**462,000**	**340,000 D**				no	no
Selenium	50		71		no	6010B	µg/L	x	x	6.4U	8.0U					6.4U	8.0U				no	no
Silver	180		2.3		yes	6010B	µg/L	x	x	12.3U	1.6U		0.25 U	0.25 U	no	12.3U	1.6U		0.25 U	0.25 U	no	yes
Sodium	160,000				no	6010B	µg/L	x	x	**8,320,000**	**7,300,000 D**					**11,200,000**	**8,900,000 D**				no	no
Thallium	4.62		7.3		yes	6020	µg/L	x	x	8.6U	0.25U	2.5U	0.25 U	0.25 U	no	8.6U	0.25U	2.5U	0.25 U	0.25 U	no	yes
Tin	22,000		0.01		yes	6010B	µg/L	x		6.0U			1.4 U	**2.8 J**	yes	6.0U			1.4 U	1.4 U	yes	yes
Vanadium	260		10,000		no	6010B	µg/L	x	x	25.9U	2.4U					**30.2**	**6.5 J**				no	no
Zinc	11,000		86		no	6010B	µg/L	x	x	6.1U	**9.7 J**					11.7U	10U				no	no

Not a Target Analyte List (TAL) Metal

Detected below lowest Action level

Reporting limit above Action level

Detected above Surface Water Action level

Detected above Groundwater Action level

Compound retained during optimization analysis

* Sodium concentrations reflect seawater values (i.e., near 10,700,000 µg/L)

No Available Data

Action Level and Appendix B (App B) Compounds (B&RE, 1998)

Target Analyte List (TAL) Compounds (B&RE, 1998)

Qualifiers:

D - Dilution Result.

J - Estimated concentration.

U - Non-detect, Reporting limit listed.

APPENDIX B

NAS KEY WEST ACTION LEVELS COMPARED WITH CURRENT FLORIDA CTLs

Table 1

Groundwater/Surface Water Metals									
Inorganics	APM Action Levels		Units	2014 Groundwater CTL		2014 Low Yield/Poor Quality CTL		2014 Marine Surface Water CTL	
	(Groundwater)	(Surface Water)		GCTL	Reference	LYPQ CTL	Reference	MSW CTL	Reference
Aluminum	37,000	1,500	µg/L	200	62-550	2,000	62-777	1,500	62-302
Antimony	6	4,300	µg/L	6	62-550	60	62-777	4,300	62-302
Arsenic	50	50	µg/L	10	62-550	100	62-777	50	62-302
Barium	2,000	10,000	µg/L	2,000	62-550	20,000	62-777	NA	62-777
Beryllium	4	0.28	µg/L	4	62-550	40	62-777	0.13	62-302
Cadmium	5	9.3	µg/L	5	62-550	50	62-777	8.8	62-302
Calcium									
Chromium	100	50	µg/L	100	62-550	1,000	62-777	50	62-777
Cobalt	2,200	35,000	µg/L	140	62-777	1,400	62-777	NA	62-777
Copper	1,500	2.9	µg/L	1,000	62-550	10,000	62-777	3.7	62-302
Iron	11,000	300	µg/L	300	62-550	3,000	62-777	300	62-302
Lead	15	5.6	µg/L	15	62-550	150	62-777	8.5	62-302
Magnesium									
Manganese	840	10	µg/L	50	62-777	500	62-777	NA	62-777
Mercury	2	1.26	µg/L	2	62-550	20	62-777	0.025	62-302
Nickel	100	8.3	µg/L	100	62-550	1,000	62-777	8.3	62-302
Potassium									
Selenium	50	71	µg/L	50	62-550	500	62-777	71	62-302
Silver	180	2.3	µg/L	100	62-550	1,000	62-777	2.3	62-302
Sodium	160,000		µg/L	160,000	62-550	1,600,000	62-777	NA	62-777
Thallium	4.62	7.3	µg/L	2	62-550	20	62-777	6.3	62-302
Tin	22,000	0.01	µg/L	4,200	62-550	42,000	62-777	NA	62-777
Vanadium	260	10,000	µg/L	49	62-777	490	62-777	NA	62-777
Zinc	11,000	86	µg/L	5,000	62-550	50,000	62-777	86	62-302

Notes:

Not a Target Analyte List (TAL) Metal

No Available Data

Action Level and Appendix B (App B) Compounds identified in the Site Investigation Workplan for Ten BRAC Properties, NASKW (Brown & Root, 1998)

Target Analyte List (TAL) Compounds identified in the Site Investigation Workplan for Ten BRAC Properties, NASKW (Brown & Root, 1998)

FAC = Florida Adminstrative Code

Assumes groundwater is Classified GIII (nonpotable) under FAC 62-520 and GIII groundwater qualifies as "poor quality" under FAC 62-77

FAC 62-777 cross references 62-302 for surface water standards where notec

FAC 62-777 cross references 62-520 which in turn cross references 62-550 for certain groundwater constituent

µg/L = micrograms per liter

Value - referenced cleanup target level is more restrictive than current action level used in the Annual Performance Monitoring Program

Value - referenced cleanup target level is less restrictive than current action level used in the Annual Performance Monitoring Program

Table 2

Groundwater/Surface Water Volatile Organic Compounds (VOCs)

Inorganics	APM Action Levels		Units	2014 Groundwater CTL		2014 Low Yield/Poor Quality CTL		2014 Marine Surface Water CTL	
	(Groundwater)	(Surface Water)		GCTL	Reference	LYPQ	Reference	MSWCTL	Reference
1,1,1,2-Tetrachloroethane	0.5		µg/L	1.3	62-777	13	62-777	NA	62-777
1,1,1-Trichloroethane	200	312	µg/L	200	62-550	2,000	62-777	270	62-777
1,1,2,2-Tetrachloroethane	0.052	10.8	µg/L	0.2	62-777	2	62-777	10.8	62-302
1,1,2-Trichloroethane	5	940	µg/L	5	62-550	50	62-777	16	62-777
1,1-Dichloroethane	810	160,000	µg/L	70	62-777	700	62-777	NA	62-777
1,1-Dichloroethene	7	3.2	µg/L	7	62-550	70	62-777	3.2	62-302
1,2,3-Trichloropropane	0.00065		µg/L	0.02	62-777	0.2	62-777	0.2	62-777
1,2-Dibromo-3-chloropropane (DBCP)	0.2		µg/L	0.2	62-550	2	62-777	NA	62-777
1,2-Dibromoethane (Ethylene dibromide [EDB])	0.05		µg/L	0.02	62-550	0.2	62-777	13	62-777
1,2-Dichloroethane (Ethylene dichloride [EDC])	3	1,130	µg/L	3	62-550	30	62-777	37	62-777
1,2-Dichloropropane	5	525	µg/L	5	62-550	50	62-777	14	62-777
1,4-Dioxane	0.67		µg/L	3.2	62-777	32	62-777	120	62-777
2-Butanone (Methyl ethyl ketone [MEK])	1,900	3,220,000	µg/L	4,200	62-777	42,000	62-777	120,000	62-777
2-Hexanone (Methyl butyl ketone)	34	428,000	µg/L	280	62-777	2800	62-777	NA	62-777
3-Chloro-1-propene (Allyl Chloride)	0.63		µg/L	35	62-777	350	62-777	NA	62-777
4-Methyl-2-pentanone (Methyl isobutyl ketone)	2,900	460,000	µg/L	560	62-777	5,600	62-777	23,000	62-777
Acetone (2-Propanone)	3,700	90,000,000	µg/L	6,300	62-777	63,000	62-777	1,700	62-777
Acetonitrile	130	160	µg/L	42	62-777	420	62-777	20,000	62-777
Acrolein	0.041	0.1	µg/L	3.5	62-777	35	62-777	0.4	62-777
Acrylonitrile	0.045	2,600	µg/L	0.06	62-777	0.6	62-777	0.2	62-777
Benzene	1	71.28	µg/L	1	62-550	10	62-777	71.28	62-302
Bromodichloromethane (Dichlorobromomethane)	100	22	µg/L	0.6	62-777	6	62-777	22	62-302
Bromoform	100	360	µg/L	4.4	62-777	44	62-777	360	62-302
Bromomethane	8.7	110	µg/L	9.8	62-777	98	62-777	35	62-777
Carbon disulfide	1,000	2	µg/L	700	62-777	7,000	62-777	110	62-777
Carbon tetrachloride	3	4.42	µg/L	3	62-550	30	62-777	4.42	62-302
Chlorobenzene (Monochlorobenzene)	100	50	µg/L	100	62-550	1,000	62-777	17	62-777
Chlorodibromomethane (Dibromochloromethane)	100	34	µg/L	0.4	62-777	4	62-777	34	62-302
Chloroethane (Ethyl chloride)	8,600	8,600	µg/L	12	62-777	120	62-777	NA	62-777
Chloroform	100	470.8	µg/L	70	62-777	700	62-777	470.8	62-302
Chloromethane (Methyl chloride)	1.4	470.8	µg/L	2.7	62-777	27	62-777	470.8	62-302
Chloroprene (2-Chloro-1,3-butadiene)	0.016		µg/L	140	62-777	1,400	62-777	NA	62-777
cis-1,2-dichloroethene	70	11,600	µg/L	70	62-550	700	62-777	NA	62-777
cis-1,3-Dichloropropene	0.077	7.9	µg/L	0.4	62-777	4	62-777	12	62-777
Dibromomethane (Methylene bromide)	7.9	6,400	µg/L	70	62-777	700	62-777	NA	62-777
Dichlorodifluoromethane	190		µg/L	1,400	62-777	14,000	62-777	NA	62-777
Ethyl Methacrylate	420		µg/L	630	62-777	6,300	62-777	NA	62-777
Ethylbenzene	700	4.3	µg/L	700	62-550	7,000	62-777	610	62-777
Isobutyl alcohol	4,600		µg/L	2,100	62-777	21,000	62-777	47,000	62-777
M+P-Xylenes *(see total xylenes)*		1.8	µg/L	(see total xylenes)		(see total xylenes)		(see total xylenes)	
Methacrylonitrile	0.75		µg/L	0.7	62-777	7	62-777	NA	62-777
Methyl iodide (Iodomethane)			µg/L						
Methyl Methacrylate	1,400		µg/L	25	62-777	250	62-777	6,500	62-777
Methylene chloride (Dichloromethane)	5	1,580	µg/L	5	62-550	50	62-777	1,580	62-302
O-Xylene *(see total xylenes)*		350	µg/L	(see total xylenes)		(see total xylenes)		(see total xylenes)	
Pentachloroethane	0.56	281	µg/L						
Propionitrile (Ethyl cyanide)			µg/L						
Styrene	100	100	µg/L	100	62-550	1,000	62-777	460	62-777
Tetrachloroethene	3	8.85	µg/L	3	62-550	30	62-777	8.85	62-302
Toluene	1,000	37	µg/L	1,000	62-550	10,000	62-777	480	62-777
Total 1,2-Dichloroethene *(see also cis- and trans-)*		590	µg/L	63	62-777	630	62-777	7,000	62-777
trans-1,2-Dichloroethene	100	1,350	µg/L	100	62-550	1,000	62-777	11,000	62-777
trans-1,3-Dichloropropene	0.077	7.9	µg/L	0.4	62-777	4	62-777	12	62-777
trans-1,4-Dichloro-2-butene	0.0012		µg/L						
Trichloroethene	3	80.7	µg/L	3	62-550	30	62-777	80.7	62-302
Trichlorofluoromethane	1,100	6,400	µg/L	2,100	62-777	21,000	62-777	NA	62-777
Vinyl acetate	410	16	µg/L	88	62-777	880	62-777	700	62-777
Vinyl chloride	1	11,600	µg/L	1	62-550	10	62-777	2.4	62-777

Table 2

Groundwater/Surface Water Volatile Organic Compounds (VOCs)

Inorganics	APM Action Levels		Units	2014 Groundwater CTL		2014 Low Yield/Poor Quality CTL		2014 Marine Surface Water CTL	
	(Groundwater)	(Surface Water)		GCTL	Reference	LYPQ	Reference	MSWCTL	Reference
Total Xylenes	**10,000**	**6,000**	**µg/L**	**10,000**	**62-550**	**100,000**	**62-777**	**370**	**62-777**

Notes:

Not an Appendix B Compound

U.S. EPA Regional Screening Level (2012) Tap Water value

U.S. EPA Regional Screening Level (2012) Maximum Contaminant Level value

NOAA SQuiRTs

No Available Data

Action Level and Appendix B (App B) Compounds identified in the Site Investigation Workplan for Ten BRAC Properties, NASKW (Brown & Root, 1998)

Appendix IX (App IX) Compounds from 40CFR Part 264 Appendix IX

FAC = Florida Adminstrative Code

Assumes groundwater is Classified GIII (nonpotable) under FAC 62-520 and GIII groundwater qualifies as "poor quality" under FAC 62-77

FAC 62-777 cross references 62-302 for surface water standards where notec

FAC 62-777 cross references 62-520 which in turn cross references 62-550 for certain groundwater constituent

µg/L = micrograms per liter

Value - referenced cleanup target level is more restrictive than current action level used in the Annual Performance Monitoring Program

Value - referenced cleanup target level is less restrictive than current action level used in the Annual Performance Monitoring Program

Table 3

Groundwater/Surface Water Semi-Volatile Organic Compounds (SVOCs)

SVOCs	APM Action Levels		Units	2014 Groundwater CTL		2014 Low Yield/Poor Quality CTL		2014 Marine Surface Water CTL	
	(Groundwater)	(Surface Water)		GCTL	Reference	LYPQ	Reference	MSWCTL	Reference
1,1'-Biphenyl	0.83	14	µg/L	0.5	62-777	5	62-777	18	62-777
1,2,4,5-Tetrachlorobenzene	1.2	10	µg/L	2.1	62-777	21	62-777	1.6	62-777
1,2,4-Trichlorobenzene	70	4.5	µg/L	70	62-550	700	62-777	23	62-777
1,2-Dichlorobenzene	600	15.8	µg/L	600	62-550	6,000	62-777	99	62-777
1,2-Diphenylhydrazine (as Azobenzene)	0.067	27	µg/L	0.04	62-777	0.4	62-777	0.2	62-777
1,3,5-Trinitrobenzene/sym-Trinitrobenzene	460		µg/L	210	62-777	2,100	62-777	19	62-777
1,3-Dichlorobenzene	540	28.5	µg/L	210	62-777	2,100	62-777	85	62-777
1,3-Dinitrobenzene/m-dinitrobenzene	1.5		µg/L	0.7	62-777	7	62-777	72	62-777
1,4-Dichlorobenzene	0.44	11.2	µg/L	75	62-550	750	62-777	3	62-777
1,4-Naphthoquinone			µg/L						
1,4-Phenylenediamine /p-phenylene diamine	3,000		µg/L	1,300	62-777	13,000	62-777	NA	62-777
1-Naphthylamine			µg/L						
2,2'-oxybis[1-chloropropane]/Bis(2-chloroisopropyl)ether	10	10	µg/L	0.5	62-777	5	62-777	23	62-777
2,3,4,6-Tetrachlorophenol	170	44	µg/L	210	62-777	2,100	62-777	4.5	62-777
2,4,5-Trichlorophenol	3,700	11	µg/L	1	62-777	10	62-777	23	62-777
2,4,6-Trichlorophenol	6.1	6.5	µg/L	3.2	62-777	32	62-777	6.5	62-302
2,4-Dichlorophenol	110	790	µg/L	0.3	62-777	3	62-777	13	62-777
2,4-Dimethylphenol	730	21.2	µg/L	140	62-777	1,400	62-777	160	62-777
2,4-Dinitrophenol	73	15	µg/L	14	62-777	140	62-777	14.26	62-302
2,4-Dinitrotoluene	73	9.1	µg/L	0.05	62-777	0.5	62-777	9.1	62-302
2,6-Dichlorophenol	35	0.2	µg/L	0.2	62-777	2	62-777	73	62-777
2,6-Dinitrotoluene	37	0.05	µg/L	0.05	62-777	0.5	62-777	0.7	62-777
2-Acetylaminofluorene	0.014		µg/L						
2-Chloronaphthalene (beta-chloronaphthalene)	550	7.5	µg/L	560	62-777	5,600	62-777	1,600	62-777
2-Chlorophenol	180	400	µg/L	35	62-777	350	62-777	130	62-777
2-Methylnaphthalene	27	300	µg/L	28	62-777	280	62-777	30	62-777
2-Methylphenol (o-Cresol; ortho-Cresol)	1,800	1,800	µg/L	35	62-777	350	62-777	250	62-777
2-Naphthylamine	0.033		µg/L	0.0003	62-777	0.003	62-777	NA	62-777
2-Nitroaniline (o-nitroaniline)	2.2	2.2	µg/L	21	62-777	210	62-777	NA	62-777
2-Nitrophenol	NA	150	µg/L						
2-Picoline			µg/L						
3-Methylphenol (m-Cresol; meta-Cresol)	1,800	1,800	µg/L	35	62-777	350	62-777	450	62-777
3,3'-Dichlorobenzidine	0.15	0.15	µg/L	0.08	62-777	0.8	62-777	0.03	62-777
3,3'-Dimethylbenzidine	0.0056		µg/L	0.004	62-777	0.04	62-777	NA	62-777
3-Methylcholanthrene	0.00098		µg/L						
3-Nitroaniline (m-nitroaniline)	110	110	µg/L	1.7	62-777	17	62-777	NA	62-777
2-Methyl-4,6-dinitrophenol/4,6-Dinitro-2-methylphenol	1.2	2.3	µg/L						
4-Aminobiphenyl	0.0026		µg/L						
4-Bromophenyl-phenyl ether	2,100	2,100	µg/L						
4-Chloro-3-methylphenol (p-chloro-m-Cresol)	1,100	0.3	µg/L	63	62-777	630	62-777	100	62-777
4-Chloroaniline (p-Chloroaniline)	150	29,700	µg/L	28	62-777	280	62-777	2.5	62-777
4-Chlorophenyl phenyl ether/1-chloro-4-phenoxy-Benzene	2		µg/L						
4-Methylphenol (p-Cresol; para-Cresol)	1,800	1,800	µg/L	3.5	62-777	35	62-777	70	62-777
4-Nitroaniline	110	110	µg/L	1.7	62-777	17	62-777	1,200	62-777
4-Nitrophenol	2,300	71.7	µg/L	56	62-777	560	62-777	55	62-777
4-Nitroquinoline-n-oxide (4-Nitroquinoline-1-oxide)			µg/L						
5-Nitro-o-toluidine/n-nitro-o-toluidine (2-methyl-5-nitroaniline)			µg/L	1.1	62-777	11	62-777	NA	62-777
7,12-Dimethylbenz(a)anthracene	0.000086		µg/L						
alpha,alpha-Dimethylphenethylamine (Phentermine)			µg/L						
Acenaphthene	2,200	2,700	µg/L	20	62-777	200	62-777	3	62-777
Acenaphthylene		300	µg/L	210	62-777	2,100	62-777	*	62-302
Acetophenone	1,500		µg/L	700	62-777	7,000	62-777	7,800	62-777
Aniline	12	2.2	µg/L	6.1	62-777	61	62-777	4	62-777
Anthracene	1,300	110,000	µg/L	2,100	62-777	21,000	62-777	0.3	62-777
Aramite, Total	2.7	20	µg/L	1.4	62-777	14	62-777	3	62-777
Benzidine	0.000092	3.9	µg/L	0.0002	62-777	0.002	62-777	0.0002	62-777
Benzo(a)anthracene	0.092	6.3	µg/L	0.05	62-777	0.5	62-777	*	62-302
Benzo(a)pyrene	0.2	0.21	µg/L	0.2	62-550	2	62-777	*	62-302

Table 3

Groundwater/Surface Water Semi-Volatile Organic Compounds (SVOCs)

SVOCs	APM Action Levels		Units	2014 Groundwater CTL		2014 Low Yield/Poor Quality CTL		2014 Marine Surface Water CTL	
	(Groundwater)	(Surface Water)		GCTL	Reference	LYPQ	Reference	MSWCTL	Reference
Benzo(b)fluoranthene	0.092	300	µg/L	0.05	62-777	0.5	62-777	*	62-302
Benzo(g,h,i)perylene	NA	300	µg/L	210	62-777	2,100	62-777	*	62-302
Benzo(k)fluoranthene	0.92	300	µg/L	0.5	62-777	5	62-777	*	62-302
Benzyl alcohol	1,500	8.6	µg/L	2,100	62-777	21,000	62-777	500	62-777
Bis(2-chloroethoxy)methane	47	6,400	µg/L						
Bis(2-chloroethyl)ether	0.0092	2,380	µg/L	0.03	62-777	0.3	62-777	0.5	62-777
Bis(2-ethylhexyl)phthalate	6	0.3	µg/L	6	62-550	60	62-777	2	62-777
Butyl benzyl phthalate	7,300	3	µg/L	140	62-777	1,400	62-777	26	62-777
Carbazole	3.4	3.4	µg/L	1.8	62-777	18	62-777	47	62-777
Chlorobenzilate	0.27		µg/L	0.1	62-777	1	62-777	0.02	62-777
Chrysene	9.2	300	µg/L	4.8	62-777	48	62-777	*	62-302
Diallate	0.46		µg/L	0.6	62-777	6	62-777	NA	62-777
Dibenzo(a,h)anthracene	0.0092	300	µg/L	0.005	62-777	0.05	62-777	*	62-302
Dibenzofuran	150	150	µg/L	28	62-777	280	62-777	67	62-777
Diethyl phthalate	29,000	3.0	µg/L	5,600	62-777	56,000	62-777	380	62-777
Dimethoate	3.1	1.1	µg/L	1.4	62-777	14	62-777	0.1	62-777
Dimethyl phthalate	370,000	3.0	µg/L	70,000	62-777	700,000	62-777	1,400	62-777
Di-n-butyl phthalate (Dibutyl phthalate)	3,700	3	µg/L	700	62-777	7,000	62-777	23	62-777
Di-n-octylphthalate	730	3	µg/L	140	62-777	1,400	62-777	NA	62-777
Dinoseb	7.0		µg/L	7	62-550	70	62-777	5.9	62-777
Disulfoton	0.38	0.4	µg/L	0.3	62-777	3	62-777	0.3	62-777
Ethyl methanesulfonate			µg/L						
Famphur			µg/L	3.5	62-777	35	62-777	NA	62-777
Fluoranthene	1,500	370	µg/L	280	62-777	2,800	62-777	0.3	62-777
Fluorene	1,500	14,000	µg/L	280	62-777	2,800	62-777	30	62-777
Hexachlorobenzene	1	3.68	µg/L	1	62-550	10	62-777	0.0003	62-777
Hexachlorobutadiene (Hexachloro-1,3-butadiene)	0.14	49.7	µg/L	0.4	62-777	4	62-777	49.7	-
Hexachlorocyclopentadiene	50	0.07	µg/L	50	62-550	500	62-777	3	62-777
Hexachloroethane	0.75	9.4	µg/L	2.5	62-777	25	62-777	3.3	62-777
Hexachlorophene	4.7	30	µg/L	2.1	62-777	21	62-777	1.1	62-777
Hexachloropropene			µg/L						
Indeno(1,2,3-cd)pyrene	0.092	300	µg/L	0.05	62-777	0.5	62-777	*	62-302
Isodrin			µg/L						
Isophorone	71	129	µg/L	37	62-777	370	62-777	650	62-777
Isosafrole			µg/L						
Kepone (Chlordecone)	0.003		µg/L	0.004	62-777	0.04	62-777	NA	62-777
Methapyrilene			µg/L						
Methyl Methanesulfonate	0.68		µg/L						
Methyl parathion	3.4	0.5	µg/L	1.8	62-777	18	62-777	0.01	62-777
Naphthalene	1,500	23.5	µg/L	14	62-777	140	62-777	26	62-777
Nitrobenzene	3.4	66.8	µg/L	3.5	62-777	35	62-777	90	62-777
N-Nitrosodiethylamine	10	768	µg/L	0.0002	62-777	0.002	62-777	0.008	62-777
N-Nitrosodimethylamine	10	10	µg/L	0.0007	62-777	0.007	62-777	3	62-777
N-Nitrosodi-n-butylamine	10	10	µg/L	0.006	62-777	0.06	62-777	0.04	62-777
N-Nitroso-di-n-propylamine	10	10	µg/L	0.005	62-777	0.05	62-777	0.5	62-777
N-nitrosodiphenylamine/Diphenylamine	14	58.5	µg/L	7.1	62-777	71	62-777	6	62-777
N-Nitrosomethylethylamine	10	10	µg/L	0.002	62-777	0.02	62-777	0.06	62-777
N-Nitrosomorpholine	0.01		µg/L						
N-Nitrosopiperidine	0.0071		µg/L						
N-Nitrosopyrrolidine	10		µg/L	0.02	62-777	0.2	62-777	NA	62-777
O,O',O"-Triethyl phosphorothioate			µg/L						
2-Toluidine/o-Toluidine (2-methylaniline)			µg/L	0.1	62-777	1	62-777	26	62-777
p-Dimethylamino azobenzene	0.0043		µg/L						
Parathion/Ethyl Parathion	65	0.6	µg/L	4.2	62-777	42	62-777	0.04	62-302
Pentachlorobenzene	10	129	µg/L	5.6	62-777	56	62-777	1.7	62-777
Pentachloronitrobenzene	0.3	0.3	µg/L	0.1	62-777	1	62-777	0.02	62-777
Pentachlorophenol	1	7.9	µg/L	1	62-550	10	62-777	7.9	62-302
Phenacetin	30		µg/L						

Table 3

Groundwater/Surface Water Semi-Volatile Organic Compounds (SVOCs)

SVOCs	APM Action Levels		Units	2014 Groundwater CTL		2014 Low Yield/Poor Quality CTL		2014 Marine Surface Water CTL	
	(Groundwater)	(Surface Water)		GCTL	Reference	LYPQ	Reference	MSWCTL	Reference
Phenanthrene		4.6	µg/L	210	62-777	2,100	62-777	*	62-302
Phenol	22,000	300	µg/L	10	62-777	100	62-777	6.5	62-777
Phorate	2.3	0.5	µg/L	1.4	62-777	14	62-777	0.005	62-777
Pronamide (Propyzamide or Kerb)	900		µg/L	53	62-777	530	62-777	NA	62-777
Pyrene	1,100	11,000	µg/L	210	62-777	2,100	62-777	0.3	62-777
Pyridine	20	25	µg/L	7	62-777	70	62-777	1,300	62-777
Safrole, Total	0.062		µg/L						
Sulfotepp (Tetraethyl Dithiopyrophosphate)	5.3		µg/L	3.5	62-777	35	62-777	0.01	62-777
Thionazin			µg/L						

Notes:

Not an Appendix B or Appendix IX Compound

Not an Appendix B Compound

U.S. EPA Regional Screening Level (2012) Tap Water value

U.S. EPA Regional Screening Level (2012)Maximum Contaminant Level value

PQL listed in 62-777 FAC PQL Tables

NOAA SQuiRTs

Detected below Action level

Compound retained during optimization analysis

No Available Data

Action Level and Appendix B (App B) Compounds identified in the Site Investigation Workplan for Ten BRAC Properties, NASKW (Brown & Root, 1998)

Appendix IX (App IX) Compounds from 40CFR Part 264 Appendix IX

FAC = Florida Adminstrative Code

Assumes groundwater is Classified GIII (nonpotable) under FAC 62-520 and GIII groundwater qualifies as "poor quality" under FAC 62-77

FAC 62-777 cross references 62-302 for surface water standards where notec

FAC 62-777 cross references 62-520 which in turn cross references 62-550 for certain groundwater constituent

* Total of these PAH compounds may not exceed 0.031 µg/L

µg/L = micrograms per liter

PAH = polycyclic aromatic hydrocarbons (or polynuclear aromatic hydrocarbons

Value - referenced cleanup target level is more restrictive than current action level used in the Annual Performance Monitoring Program

Table 4

Groundwater/Surface Water Pesticides/PCBs

Pesticides/PCBs	APM Action Levels		Units	2014 Groundwater CTL		2014 Low Yield/Poor Quality CTL		2014 Marine Surface Water CTL	
	(Groundwater)	(Surface Water)		GCTL	Reference	LYPQ CTL	Reference	MSW CTL	Reference
4,4'-DDD	0.28	0.0064	µg/L	0.1	62-777	1	62-777	0.0003	62-777
4,4'-DDE	0.2	0.14	µg/L	0.1	62-777	1	62-777	0.0002	62-777
4,4'-DDT	0.2	0.00059	µg/L	0.1	62-777	1	62-777	0.00059	62-302
Aldrin	0.004	0.00014	µg/L	0.002	62-777	0.02	62-777	0.00014	62-302
alpha-BHC	0.011	0.34	µg/L	0.006	62-777	0.06	62-777	0.005	62-777
Arochlor (mixtures)	(see PCBs)			(see PCBs)		(see PCBs)		(see PCBs)	
beta-BHC	0.037	0.046	µg/L	0.02	62-777	0.2	62-777	0.046	62-302
Chlordane (technical)	0.052	0.052	µg/L	2	62-550	20	62-777	0.00059	62-302
delta-BHC		0.34	µg/L	2.1	62-777	21	62-777	NA	62-777
Dieldrin	0.0042	0.00014	µg/L	0.002	62-777	0.02	62-777	0.00014	62-302
Endosulfan I	220	0.0087	µg/L	42	62-777	420	(total endosulfan)	0.0087	62-302
Endosulfan II	220	0.0087	µg/L	42	62-777	420	(total endosulfan)	0.0087	62-302
Endosulfan sulfate		0.1	µg/L	42	62-777	420	(total endosulfan)	0.0087	62-302
Endrin	2	0.0023	µg/L	2	62-550	20	62-777	0.0023	62-302
Endrin aldehyde			µg/L						
Endrin ketone			µg/L						
gamma-BHC (Lindane)	0.2	0.063	µg/L	0.2	62-550	2	62-777	0.063	62-302
Heptachlor	0.4	0.00021	µg/L	0.4	62-550	4	62-777	0.00021	62-302
Heptachlor epoxide	0.2	0.0036	µg/L	0.2	62-550	2	62-777	0.00004	62-777
Methoxychlor	40	0.03	µg/L	40	62-550	400	62-777	0.03	62-302
Polychlorinated biphenyls (PCBs)	0.5	0.000045	µg/L	0.5	62-550	5	62-777	0.000045	62-302
Toxaphene	3	0.0002	µg/L	3	62-550	30	62-777	0.0002	62-302

Notes:

Not an Appendix IX Compound

PQL listed in 62-777 FAC PQL Table E (Marine Surface Water)

No Available Data

Action Level and Appendix B (App B) Compounds identified in the Site Investigation Workplan for Ten BRAC Properties, NASKW (Brown & Root, 1998)

Appendix IX (App IX) Compounds from 40CFR Part 264 Appendix IX

FAC = Florida Adminstrative Code

Assumes groundwater is Classified GIII (nonpotable) under FAC 62-520 and GIII groundwater qualifies as "poor quality" under FAC 62-77

FAC 62-777 cross references 62-302 for surface water standards where notec

FAC 62-777 cross references 62-520 which in turn cross references 62-550 for certain groundwater constituent

µg/L = micrograms per liter

PCBs = plychlorinated biphenyls

Value - referenced cleanup target level is more restrictive than current action level used in the Annual Performance Monitoring Program

Value - referenced cleanup target level is less restrictive than current action level used in the Annual Performance Monitoring Program

APPENDIX C

SITE INSPECTION/INTERVIEW FORMS

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST

I. SITE INFORMATION

Site name: AOC B	**Date of inspection**: December 2013
Location and Region: Big Coppitt Key	**FDEP ID**: DOD_9_1059
Agency, office, or company leading the five-year review: Naval Air Station Key West	**Weather/temperature**: sunny/82 ^{o}F

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☑ Access controls
- ☑ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Other
- ☐ Surface water collection and treatment
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☐ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (Check all that apply)

1. **NAVFAC SE Remedial Project Manager**

Brian Syme (Name) | RPM, NAVFAC SE (Title) | 07/07/2014 (Date)

Meeting ☐ at site ☐ at office ☐ by phone Phone no. (904) 542-6151

Site status, adjacent activities, suggestions: ☐ Report attached

2. **NAS Key West Environmental Division**

Chip Palm (Name) | IRP Manager, NAS Key West (Title) | 06/02/2014 (Date)

Meeting ☐ at site ☐ at office ☐ by phone Phone no. (305) 797-4461

Site status, adjacent activities, suggestions: ☐ Report attached

3. **Other:**

Name | Title | Date

Interviewed ☐ at site ☐ at office ☐ by phone Phone no.

Adjacent activities; local facility contacts; suggestions: ☐ Report attached

4. **Local regulatory authorities and response agencies:**

Agency

Contact

Name | Title | Date | Phone No.

Problems; regulations or policy changes; suggestions; ☐ Report attached

5. **Other interviews** (optional) ☐ Report attached.

Agency

Contact

Name | Title | Date | Phone No.

Problems; regulations or policy changes; suggestions; ☐ Report attached

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **Existing Facility Documents**: ☑ N/A

❑ incident reports	❑ Readily available at Envir. Div.	☐ Up to date	☐ N/A
❑ waste mngt. Records	❑ Readily available at Envir. Div.	☐ Up to date	☐ N/A
❑ service agreements	❑ Readily available	☐ Up to date	☐ N/A

Contact Chip Palm (Name) | IRP Manager (Title) | 06/02/2014 (Date) | (305) 797-4461 (Phone No.)

Problems; regulations or policy changes; suggestions; ☐ Report attached

2. **NAS Key West Environmental Division Records**

☑ Past activities in site area	☑ Readily available	☑ Up to date	☐ N/A
☑ Current activities in site area	☑ Readily available	☑ Up to date	☐ N/A
☑ Planned activities in site area	☑ Readily available	☑ Up to date	☐ N/A

Remarks:

3. **Records of other activities**

☑ Readily available ☑ Up to date ☐ N/A

Department: Navy Remarks:

Searchable Administrative Record available via public website http://go.usa.gov/KSDJ

V. ACCESS AND LAND USE CONTROLS (reduced to potentially applicable elements)

A. **Fencing**

☑ Fencing	☑ Gates	☑ Good Condition	☐ N/A
☐ Fencing damaged/ needs maintenance		☐ Gates damaged/ needs maintenance	

Remarks:

B. **Other Access Restrictions**

☑ Signs and other security measures	☑ Location shown on site map	☐ N/A
☑ Good Condition	☐ needs maintenance	

Remarks:

C. **Institutional Controls (ICs)** (May be in the form of land use controls and deed restrictions)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented	☐ Yes	☑ No	☐ N/A
Site conditions imply ICs not being fully enforced	☐ Yes	☑ No	☐ N/A

Type of monitoring (e.g., self-reporting, drive by) Self-reporting

Frequency: quarterly

Responsible party/agency: NAS Key West Environmental Division

Contact Chip Palm (Name) | IRP Manager (Title) | 06/02/2014 (Date) | (305) 797-4461 (Phone No.)

Reporting is up-to-date	☑ Yes	☐ No	☐ N/A
Reports are verified by the lead agency	☑ Yes	☐ No	☐ N/A
Specific requirements in deed or decision documents have been met	☑ Yes	☐ No	☐ N/A

Violations have been reported ☐ Yes ☐ No ☑ N/A

Other Problems or suggestions: ☐ Report attached

2. **Adequacy** ☑ ICs are adequate ☐ ICs are inadequate ☐ N/A

Remarks:

D. **General**

1. **Vandalism/trespassing** ☐ Location shown on site map ☑ No vandalism evident

Remarks:

2. **Land use changes on site** ☑ N/A

Remarks:

3. **Land use changes off site** ☑ N/A

Remarks:

VI. GENERAL SITE CONDITIONS

A. **Roads** ☑ Applicable ☐ N/A

B. **Other Site Conditions**

VII. LANDFILL COVERS ☐ Applicable ☑ N/A

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☑ N/A

IX. GROUNDWATER REMEDIES ☐ Applicable ☑ N/A

X. OTHER REMEDIES ☐ Applicable ☑ N/A

XI. OVERALL OBSERVATIONS

A. **Implementation of the Remedy**

Described issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.)

Brian Syme – No issues noted with the remedy on my last visual inspection of the site.

B. **Adequacy of O&M** (including pre-construction communications)

Described issues and observations relating to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

Brian Syme – No issues to describe.

C. **Early Indicators of Potential Remedy Problems**

Described issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

Brian Syme – No issues to describe.

D. **Opportunities of Optimization**

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

Brian Syme – Monitoring optimized.

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST

I. SITE INFORMATION

Site name: IR 1	**Date of inspection**: December 2013
Location and Region: Truman Annex	**FDEP ID**: DOD_9_1050
Agency, office, or company leading the five-year review: Naval Air Station Key West Florida	**Weather/temperature**: Sunny/ 82 ^{o}F

Remedy Includes: (Check all that apply)

- ☑ Landfill cover/containment
- ☑ Access controls
- ☑ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Other
- ☐ Surface water collection and treatment
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☐ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (Check all that apply)

1. **NAVFAC SE Remedial Project Manager**

Brian Syme (Name) | RPM, NAVFAC SE (Title) | 07/07/2014 (Date)

Meeting ☐ at site ☐ at office ☐ by phone Phone no. (904) 542-6151

Site status, adjacent activities, suggestions: ☐ Report attached

2. **NAS Key West Environmental Division**

Chip Palm (Name) | IRP Manager, NAS Key West (Title) | 06/02/2014 (Date)

Meeting ☐ at site ☐ at office ☐ by phone Phone no. (305) 797-4461

Site status, adjacent activities, suggestions: ☐ Report attached

3. **Other:**

Name | Title | Date

Interviewed ☐ at site ☐ at office ☐ by phone Phone no.

Adjacent activities; local facility contacts; suggestions: ☐ Report attached

4. **Local regulatory authorities and response agencies:**

Agency

Contact

Name | Title | Date | Phone No.

Problems; regulations or policy changes; suggestions; ☐ Report attached

5. **Other interviews** (optional) ☐ Report attached.

Agency

Contact

Name | Title | Date | Phone No.

Problems; regulations or policy changes; suggestions; ☐ Report attached

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III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **Existing Facility Documents**: ☐ N/A

☑ incident reports	☑ Readily available at Envir. Div.	☑ Up to date	☐ N/A
☐ waste mngt. Records	☐ Readily available at Envir. Div.	☐ Up to date	☐ N/A
☐ service agreements	☐ Readily available	☐ Up to date	☐ N/A

Contact: Chip Palm (Name) | IRP Manager (Title) | 06/02/2014 (Date) | (305) 797-4461 (Phone No.)

Problems; regulations or policy changes; suggestions; ☐ Report attached

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2. **NAS Key West Environmental Division Records**

☑ Past activities in site area	☑ Readily available	☑ Up to date	☐ N/A
☑ Current activities in site area	☑ Readily available	☑ Up to date	☐ N/A
☑ Planned activities in site area	☑ Readily available	☑ Up to date	☐ N/A

Remarks:

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3. **Records of other activities**

☑ Readily available ☑ Up to date ☐ N/A

Department: Navy Remarks:

Searchable Administrative Record available via public website http://go.usa.gov/KSDJ

V. ACCESS AND LAND USE CONTROLS (reduced to potentially applicable elements)

A. **Fencing**

☑ Fencing ☑ Gates ☑ Good Condition ☐ N/A

☐ Fencing damaged/ needs maintenance ☐ Gates damaged/ needs maintenance

Remarks: Fencing is present around the perimeter of the site. The site is within the fence line of NAS Key West – Truman Annex.

B. **Other Access Restrictions**

☑ Signs and other security measures ☐ Location shown on site map ☐ N/A

☑ Good Condition ☐ needs maintenance

Remarks:

C. **Institutional Controls (ICs)** (May be in the form of land use controls and deed restrictions)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented	☐ Yes	☑ No	☐ N/A
Site conditions imply ICs not being fully enforced	☐ Yes	☑ No	☐ N/A

Type of monitoring (e.g., self-reporting, drive by): Self-reporting

Frequency: quarterly

Responsible party/agency: NAS Key West Environmental Division

Contact: Chip Palm (Name) | IRP Manager (Title) | 06/02/2014 (Date) | (305) 797-4461 (Phone No.)

Reporting is up-to-date	☑ Yes	☐ No	☐ N/A
Reports are verified by the lead agency	☑ Yes	☐ No	☐ N/A

Specific requirements in deed or decision documents have been met ☑ Yes ☐ No ☐ N/A

Violations have been reported ☐ Yes ☐ No ☑ N/A

Other Problems or suggestions: ☐ Report attached

2. **Adequacy** ☑ ICs are adequate ☐ ICs are inadequate ☐ N/A

Remarks:

D. **General**

1. **Vandalism/trespassing** ☐ Location shown on site map ☑ No vandalism evident

Remarks:

2. **Land use changes on site** ☑ N/A

Remarks:

3. **Land use changes off site** ☑ N/A

Remarks:

VI. GENERAL SITE CONDITIONS

A. **Roads** ☑ Applicable ☐ N/A

B. **Other Site Conditions**

VII. LANDFILL COVERS ☑ Applicable ☐ N/A

1. **Landfill cover** ☑ Good Condition ☐ Proper secondary containment ☐ Needs maintenance ☐ N/A

Remarks

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☑ N/A

IX. GROUNDWATER REMEDIES

A. **Groundwater Extraction wells, pumps and pipelines** ☐ Applicable ☑ N/A

B. **Surface Water Collection Structures, Pumps, and Pipelines** ☐ Applicable ☑ N/A

C. **Treatment System** ☐ Applicable ☑ N/A

1. **Treatment**

Metals removal Oil/Water separation Bioremediation
Air Stripping Carbon adsorbers
Filters
Additive
Other

☐ Good Condition ☐ Needs maintenance
☐ Sampling ports properly marked and functional
☐ Sampling/maintenance log displayed and up to date
☐ Equipment properly identified

Quantity of groundwater treated annually_____
Quantity of surface water treated annually_____
Airflow rate_____
Other operational parameters_____

Remarks Annual performance monitoring is being performed to assess the impact of the Interim Removal Action of 1996 and 2003.

2. **Electrical enclosures and panels** (properly rated and functional)

☐ Good Condition ☐ All equipment properly operating ☐ Needs maintenance ☑ N/A

Remarks

3. **Tanks, vaults and storage vessels**

☐ Good Condition ☐ Proper secondary containment ☐ Needs maintenance ☑ N/A

Remarks

4. **Discharge Structure and appurtenances**

☐ Good Condition ☐ All equipment properly operating ☐ Needs maintenance ☑ N/A

Remarks

5. **Treatment building(s)**

☐ Good Condition ☐ Needs repair ☑ N/A ☐ Chemicals and equipment properly stored

Remarks

6. **Monitoring well(s)**

☑ Properly secured ☑ Functioning ☑ Routinely sampled ☑ Good condition

☑ All required wells located ☐ Needs repair ☐ N/A

Remarks The casing of monitoring well I1MW03 was repaired December 2013.

7. **Monitoring data**

☑ Routinely submitted on time ☑ Acceptable Quality

Remarks

8. **Monitoring data suggests:**

☑ Groundwater plume is effectively contained ☑ Contaminant concentrations are declining

Remarks

D. **Monitored Natural Attenuation** ☐ Applicable ☑ N/A

X. OTHER REMEDIES ☐ Applicable ☑ N/A

XI. OVERALL OBSERVATIONS

A. **Implementation of the Remedy**

Described issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.)

Brian Syme - No issues observed with the remedy at my last inspection.

B. **Adequacy of O&M** (including pre-construction communications)

Described issues and observations relating to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

Brian Syme - No issues to describe.

C. **Early Indicators of Potential Remedy Problems**

Described issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

Brian Syme - No issues to describe.

D. **Opportunities of Optimization**

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

Brian Syme - Efforts to optimize the monitoring program are currently ongoing.

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST

I. SITE INFORMATION

Site name: IR 3	**Date of inspection**: December 2013
Location and Region: Truman Annex	**FDEP ID**: DOD_9_1052
Agency, office, or company leading the five-year review: Naval Air Station Key West	**Weather/temperature**: sunny/82 ^{o}F

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☑ Access controls
- ☑ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Other
- ☐ Surface water collection and treatment
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☐ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (Check all that apply)

1. **NAVFAC SE Remedial Project Manager**

Brian Syme (Name) | RPM, NAVFAC SE (Title) | 07/07/2014 (Date)

Meeting ☐ at site ☐ at office ☐ by phone Phone no. (904) 542-6151

Site status, adjacent activities, suggestions: ☐ Report attached

2. **NAS Key West Environmental Division**

Chip Palm (Name) | IRP Manager, NAS Key West (Title) | 06/02/2014 (Date)

Meeting ☐ at site ☐ at office ☐ by phone Phone no. (305) 797-4461

Site status, adjacent activities, suggestions: ☐ Report attached

3. **Other:**

Name | Title | Date

Interviewed ☐ at site ☐ at office ☐ by phone Phone no.

Adjacent activities; local facility contacts; suggestions: ☐ Report attached

4. **Local regulatory authorities and response agencies:**

Agency

Contact

Name | Title | Date | Phone No.

Problems; regulations or policy changes; suggestions; ☐ Report attached

5. **Other interviews** (optional) ☐ Report attached.

Agency

Contact

Name | Title | Date | Phone No.

Problems; regulations or policy changes; suggestions; ☐ Report attached

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III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **Existing Facility Documents**: ☑ N/A

❑ incident reports	❑ Readily available at Envir. Div.	☐ Up to date	☑ N/A
❑ waste mngt. Records	❑ Readily available at Envir. Div.	☐ Up to date	☑ N/A
❑ service agreements	❑ Readily available	☐ Up to date	☑ N/A

Contact Chip Palm (Name) | IRP Manager (Title) | 06/02/2014 (Date) | (305) 797-4461 (Phone No.)

Problems; regulations or policy changes; suggestions; ☐ Report attached

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2. **NAS Key West Environmental Division Records**

☑ Past activities in site area	☑ Readily available	☑ Up to date	☐ N/A
☑ Current activities in site area	☑ Readily available	☑ Up to date	☐ N/A
☑ Planned activities in site area	☑ Readily available	☑ Up to date	☐ N/A

Remarks:

3. **Records of other activities**

☑ Readily available ☑ Up to date ☐ N/A

Department: Navy Remarks:

Searchable Administrative Record available via public website http://go.usa.gov/KSDJ

V. ACCESS AND LAND USE CONTROLS (reduced to potentially applicable elements)

A. **Fencing**

☐ Fencing	☐ Gates	☐ Good Condition	☑ N/A
☐ Fencing damaged/ needs maintenance		☐ Gates damaged/ needs maintenance	

Remarks:

B. **Other Access Restrictions**

☐ Signs and other security measures	☐ Location shown on site map	☑ N/A
☐ Good Condition	☐ needs maintenance	

Remarks:

C**. Institutional Controls (ICs)** (May be in the form of land use controls and deed restrictions)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented	☐ Yes	☑ No	☐ N/A
Site conditions imply ICs not being fully enforced	☐ Yes	☑ No	☐ N/A

Type of monitoring (e.g., self-reporting, drive by) Self-reporting

Frequency: quarterly

Responsible party/agency: NAS Key West Environmental Division

Contact Chip Palm (Name) | IRP Manager (Title) | 06/02/2014 (Date) | (305) 797-4461 (Phone No.)

Reporting is up-to-date	☑ Yes	☐ No	☐ N/A
Reports are verified by the lead agency	☑ Yes	☐ No	☐ N/A

Specific requirements in deed or decision documents have been met ☑ Yes ☐ No ☐ N/A

Violations have been reported ☐ Yes ☐ No ☑ N/A

Other Problems or suggestions: ☐ Report attached

2. **Adequacy** ☑ ICs are adequate ☐ ICs are inadequate ☐ N/A

Remarks:

D. **General**

1. **Vandalism/trespassing** ☐ Location shown on site map ☑ No vandalism evident

Remarks:

2. **Land use changes on site** ☑ N/A

Remarks:

3. **Land use changes off site** ☑ N/A

Remarks:

VI. GENERAL SITE CONDITIONS

A. **Roads** ☑ Applicable ☐ N/A

B. **Other Site Conditions**

VII. LANDFILL COVERS ☐ Applicable ☑ N/A

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☑ N/A

IX. GROUNDWATER REMEDIES ☐ Applicable ☑ N/A

X. OTHER REMEDIES ☐ Applicable ☑ N/A

XI. OVERALL OBSERVATIONS

A. **Implementation of the Remedy**

Described issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.)

Brian Syme – LUC and cap in place to prevent exposure. No issues noted during time of inspection.

B. **Adequacy of O&M** (including pre-construction communications)

Described issues and observations relating to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

Brian Syme – No issues noted during time of inspection.

C. **Early Indicators of Potential Remedy Problems**

Described issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

Brian Syme – None to report.

D. **Opportunities of Optimization**

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

Brian Syme – Site monitoring optimized.

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST

I. SITE INFORMATION

Site name: IR 7	**Date of inspection**: December 2013
Location and Region: Fleming Key	**FDEP ID**: DOD_9_1056
Agency, office, or company leading the five-year review: Naval Air Station Key West	**Weather/temperature**: sunny/82 ^{o}F

Remedy Includes: (Check all that apply)

- ☑ Landfill cover/containment
- ☑ Access controls
- ☑ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Other
- ☐ Surface water collection and treatment
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☐ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (Check all that apply)

1. **NAVFAC SE Remedial Project Manager**

Brian Syme (Name) | RPM, NAVFAC SE (Title) | 07/07/2014 (Date)

Meeting ☐ at site ☐ at office ☐ by phone Phone no. (904) 542-6151

Site status, adjacent activities, suggestions: ☐ Report attached

2. **NAS Key West Environmental Division**

Chip Palm (Name) | IRP Manager, NAS Key West (Title) | 06/02/2014 (Date)

Meeting ☐ at site ☐ at office ☐ by phone Phone no. (305) 797-4461

Site status, adjacent activities, suggestions: ☐ Report attached

3. **Other:**

Name | Title | Date

Interviewed ☐ at site ☐ at office ☐ by phone Phone no.

Adjacent activities; local facility contacts; suggestions: ☐ Report attached

4. **Local regulatory authorities and response agencies:**

Agency

Contact

Name | Title | Date | Phone No.

Problems; regulations or policy changes; suggestions; ☐ Report attached

5. **Other interviews** (optional) ☐ Report attached.

Agency

Contact

Name | Title | Date | Phone No.

Problems; regulations or policy changes; suggestions; ☐ Report attached

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **Existing Facility Documents**: ☑ N/A

❑ incident reports	❑ Readily available at Envir. Div.	☐ Up to date	☑ N/A
❑ waste mngt. Records	❑ Readily available at Envir. Div.	☐ Up to date	☑ N/A
❑ service agreements	❑ Readily available	☐ Up to date	☑ N/A

Contact: Chip Palm (Name) | IRP Manager (Title) | 06/02/2014 (Date) | (305) 797-4461 (Phone No.)

Problems; regulations or policy changes; suggestions; ☐ Report attached

2. **NAS Key West Environmental Division Records**

☑ Past activities in site area	☑ Readily available	☑ Up to date	☐ N/A
☑ Current activities in site area	☑ Readily available	☑ Up to date	☐ N/A
☑ Planned activities in site area	☑ Readily available	☑ Up to date	☐ N/A

Remarks:

3. **Records of other activities**

☑ Readily available ☑ Up to date ☐ N/A

Department: Navy Remarks:

Searchable Administrative Record available via public website http://go.usa.gov/KSDJ

V. ACCESS AND LAND USE CONTROLS (reduced to potentially applicable elements)

A. **Fencing**

☐ Fencing ☐ Gates ☐ Good Condition ☑ N/A

☐ Fencing damaged/ needs maintenance ☐ Gates damaged/ needs maintenance

Remarks: Fencing is not present around the perimeter of the site. The site is within the fence line of NAS Key West – Trumbo Point Annex.

B. **Other Access Restrictions**

☑ Signs and other security measures ☐ Location shown on site map ☐ N/A

☑ Good Condition ☐ needs maintenance

Remarks:

C. **Institutional Controls (ICs)** (May be in the form of land use controls and deed restrictions)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented	☐ Yes	☑ No	☐ N/A
Site conditions imply ICs not being fully enforced	☐ Yes	☑ No	☐ N/A

Type of monitoring (e.g., self-reporting, drive by): Self-reporting

Frequency: quarterly

Responsible party/agency: NAS Key West Environmental Division

Contact: Chip Palm (Name) | IRP Manager (Title) | 06/02/2014 (Date) | (305) 797-4461 (Phone No.)

Reporting is up-to-date	☑ Yes	☐ No	☐ N/A
Reports are verified by the lead agency	☑ Yes	☐ No	☐ N/A
Specific requirements in deed or decision documents have been met	☑ Yes	☐ No	☐ N/A

Violations have been reported ☐ Yes ☐ No ☑ N/A

Other Problems or suggestions: ☐ Report attached

2. **Adequacy** ☑ ICs are adequate ☐ ICs are inadequate ☐ N/A

Remarks:

D. **General**

1. **Vandalism/trespassing** ☐ Location shown on site map ☑ No vandalism evident

Remarks:

2. **Land use changes on site** ☑ N/A

Remarks:

3. **Land use changes off site** ☑ N/A

Remarks:

VI. GENERAL SITE CONDITIONS

A. **Roads** ☑ Applicable ☐ N/A

B. **Other Site Conditions**

VII. LANDFILL COVERS ☑ Applicable ☐ N/A

1. **Landfill cover**

☑ Good Condition ☐ Needs maintenance ☐ N/A

Remarks Vegetative growth is excessive within the footprint of IR-7.

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☑ N/A

IX. GROUNDWATER REMEDIES

A. **Groundwater Extraction wells, pumps and pipelines** ☐ Applicable ☑ N/A

B. **Surface Water Collection Structures, Pumps, and Pipelines** ☐ Applicable ☑ N/A

C. **Treatment System** ☐ Applicable ☑ N/A

1. **Treatment**

Metals removal Oil/Water separation Bioremediation
Air Stripping Carbon adsorbers
Filters
Additive
Other

☐ Good Condition ☐ Needs maintenance
☐ Sampling ports properly marked and functional
☐ Sampling/maintenance log displayed and up to date
☐ Equipment properly identified
Quantity of groundwater treated annually_____
Quantity of surface water treated annually_____
Airflow rate_____
Other operational parameters_____

Remarks Annual performance monitoring is being.

2. **Electrical enclosures and panels** (properly rated and functional)

☐ Good Condition ☐ All equipment properly operating ☐ Needs maintenance ☑ N/A

Remarks

3. **Tanks, vaults and storage vessels**

☐ Good Condition ☐ Proper secondary containment ☐ Needs maintenance ☑ N/A

Remarks

4. **Discharge Structure and appurtenances**

☐ Good Condition ☐ All equipment properly operating ☐ Needs maintenance ☑ N/A

Remarks

5. **Treatment building(s)**

☐ Good Condition ☐ Needs repair ☑ N/A ☐ Chemicals and equipment properly stored

Remarks

6. **Monitoring well(s)**

☑ Properly secured ☑ Functioning ☑ Routinely sampled ☑ Good condition

☑ All required wells located ☐ Needs repair ☐ N/A

Remarks The protective outer casing of monitoring well I7MW7-03 was repaired December 2013.

7. **Monitoring data**

☑ Routinely submitted on time ☑ Acceptable Quality

Remarks

8. **Monitoring data suggests:**

☑ Groundwater plume is effectively contained ☑ Contaminant concentrations are declining

Remarks

D. **Monitored Natural Attenuation** ☐ Applicable ☑ N/A

X. OTHER REMEDIES ☐ Applicable ☑ N/A

XI. OVERALL OBSERVATIONS

A. **Implementation of the Remedy**

Described issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.)

Brian Syme – Old landfill site covered with vegetation and trees. No issues observed during inspection.

B. **Adequacy of O&M** (including pre-construction communications)

Described issues and observations relating to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

Brian Syme –No issues observed during inspection.

C. **Early Indicators of Potential Remedy Problems**

Described issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

Brian Syme –No issues observed during inspection.

D. **Opportunities of Optimization**

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

Brian Syme – Site currently undergoing optimization of monitoring program.

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST

I. SITE INFORMATION

Site name: IR 8	**Date of inspection**: December 2013
Location and Region: Fleming Key	**FDEP ID**: DOD_9_1057
Agency, office, or company leading the five-year review: Naval Air Station Key West	**Weather/temperature**: Sunny/ 82 ^{o}F

Remedy Includes: (Check all that apply)

- ☑ Landfill cover/containment
- ☑ Access controls
- ☑ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Other
- ☐ Surface water collection and treatment
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☐ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (Check all that apply)

1. **NAVFAC SE Remedial Project Manager**

Brian Syme (Name) | RPM, NAVFAC SE (Title) | 07/07/2014 (Date)

Meeting ☐ at site ☐ at office ☐ by phone Phone no. (904) 542-6151

Site status, adjacent activities, suggestions: ☐ Report attached

2. **NAS Key West Environmental Division**

Chip Palm (Name) | IRP Manager, NAS Key West (Title) | 06/02/2014 (Date)

Meeting ☐ at site ☐ at office ☐ by phone Phone no. (305) 797-4461

Site status, adjacent activities, suggestions: ☐ Report attached

3. **Other:**

____ (Name) | ____ (Title) | ____ (Date)

Interviewed ☐ at site ☐ at office ☐ by phone Phone no.

Adjacent activities; local facility contacts; suggestions: ☐ Report attached

4. **Local regulatory authorities and response agencies:**

Agency

Contact — Name | Title | Date | Phone No.

Problems; regulations or policy changes; suggestions; ☐ Report attached

5. **Other interviews** (optional) ☐ Report attached.

Agency

Contact — Name | Title | Date | Phone No.

Problems; regulations or policy changes; suggestions; ☐ Report attached

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III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **Existing Facility Documents**: ☑ N/A

❑ incident reports	❑ Readily available at Envir. Div.	☐ Up to date	☑ N/A
❑ waste mngt. Records	❑ Readily available at Envir. Div.	☐ Up to date	☑ N/A
❑ service agreements	❑ Readily available	☐ Up to date	☑ N/A

Contact Chip Palm (Name) | IRP Manager (Title) | 06/02/2014 (Date) | (305) 797-4461 (Phone No.)

Problems; regulations or policy changes; suggestions; ☐ Report attached

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2. **NAS Key West Environmental Division Records**

☑ Past activities in site area	☑ Readily available	☑ Up to date	☐ N/A
☑ Current activities in site area	☑ Readily available	☑ Up to date	☐ N/A
☑ Planned activities in site area	☑ Readily available	☑ Up to date	☐ N/A

Remarks:

3. **Records of other activities**

☑ Readily available ☑ Up to date ☐ N/A

Department: Navy Remarks:

Searchable Administrative Record available via public website http://go.usa.gov/KSDJ

V. ACCESS AND LAND USE CONTROLS (reduced to potentially applicable elements)

A. **Fencing**

☑ Fencing ☑ Gates ☑ Good Condition ☐ N/A

☐ Fencing damaged/ needs maintenance ☐ Gates damaged/ needs maintenance

Remarks: Fencing is present around the perimeter of the site. The site is within the fence line of NAS Key West – Trumbo Point Annex.

B. **Other Access Restrictions**

☑ Signs and other security measures ☐ Location shown on site map ☐ N/A

☑ Good Condition ☐ needs maintenance

Remarks:

C. **Institutional Controls (ICs)** (May be in the form of land use controls and deed restrictions)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented	☐ Yes	☑ No	☐ N/A
Site conditions imply ICs not being fully enforced	☐ Yes	☑ No	☐ N/A

Type of monitoring (e.g., self-reporting, drive by) Self-reporting

Frequency: quarterly

Responsible party/agency: NAS Key West Environmental Division

Contact Chip Palm (Name) | IRP Manager (Title) | 06/02/2014 (Date) | (305) 797-4461 (Phone No.)

Reporting is up-to-date	☑ Yes	☐ No	☐ N/A
Reports are verified by the lead agency	☑ Yes	☐ No	☐ N/A

Specific requirements in deed or decision documents have been met ☑ Yes ☐ No ☐ N/A

Violations have been reported ☐ Yes ☐ No ☑ N/A

Other Problems or suggestions: ☐ Report attached

2. **Adequacy** ☑ ICs are adequate ☐ ICs are inadequate ☐ N/A

Remarks:

D. **General**

1. **Vandalism/trespassing** ☐ Location shown on site map ☑ No vandalism evident

Remarks:

2. **Land use changes on site** ☑ N/A

Remarks:

3. **Land use changes off site** ☑ N/A

Remarks:

VI. GENERAL SITE CONDITIONS

A. **Roads** ☑ Applicable ☐ N/A

B. **Other Site Conditions**

VII. LANDFILL COVERS ☑ Applicable ☐ N/A

1. **Landfill cover**

☑ Good Condition ☐ Needs maintenance ☐ N/A

Remarks Vegetative growth is excessive within the footprint of IR-8.

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☑ N/A

IX. GROUNDWATER REMEDIES

A. **Groundwater Extraction wells, pumps and pipelines** ☐ Applicable ☑ N/A

B. **Surface Water Collection Structures, Pumps, and Pipelines** ☐ Applicable ☑ N/A

C. **Treatment System** ☐ Applicable ☑ N/A

1. **Treatment**

Metals removal Oil/Water separation Bioremediation
Air Stripping Carbon adsorbers
Filters
Additive
Other

☐ Good Condition ☐ Needs maintenance
☐ Sampling ports properly marked and functional
☐ Sampling/maintenance log displayed and up to date
☐ Equipment properly identified

Quantity of groundwater treated annually_____
Quantity of surface water treated annually_____
Airflow rate_____
Other operational parameters_____

Remarks Annual performance monitoring is being performed.

2. **Electrical enclosures and panels** (properly rated and functional)

☐ Good Condition ☐ All equipment properly operating ☐ Needs maintenance ☑ N/A

Remarks

3. **Tanks, vaults and storage vessels**

☐ Good Condition ☐ Proper secondary containment ☐ Needs maintenance ☑ N/A

Remarks

4. **Discharge Structure and appurtenances**

☐ Good Condition ☐ All equipment properly operating ☐ Needs maintenance ☑ N/A

Remarks

5. **Treatment building(s)**

☐ Good Condition ☐ Needs repair ☑ N/A ☐ Chemicals and equipment properly stored

Remarks

6. **Monitoring well(s)**

☑ Properly secured ☑ Functioning ☑ Routinely sampled ☑ Good condition

☑ All required wells located ☐ Needs repair ☐ N/A

Remarks

7. **Monitoring data**

☑ Routinely submitted on time ☑ Acceptable Quality

Remarks

8. **Monitoring data suggests:**

☑ Groundwater plume is effectively contained ☑ Contaminant concentrations are declining

Remarks

D. **Monitored Natural Attenuation** ☐ Applicable ☑ N/A

X. OTHER REMEDIES ☐ Applicable ☑ N/A

XI. OVERALL OBSERVATIONS

A. **Implementation of the Remedy**

Described issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.)

Brian Syme – Old landfill site covered with vegetation and trees. No issues observed during inspection.

B. **Adequacy of O&M** (including pre-construction communications)

Described issues and observations relating to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

Brian Syme –No issues observed during inspection.

C. **Early Indicators of Potential Remedy Problems**

Described issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

Brian Syme –No issues observed during inspection.

D. **Opportunities of Optimization**

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

Brian Syme – Site currently undergoing optimization of monitoring program.

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST

I. SITE INFORMATION	
Site name: IR 21	**Date of inspection**: December 2013
Location and Region: Truman Annex	**FDEP ID**: DOD_9_3296
Agency, office, or company leading the five-year review: Naval Air Station Key West	**Weather/temperature**: Sunny/82 ^{o}F

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☑ Access controls
- ☑ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Other
- ☐ Surface water collection and treatment
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☐ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (Check all that apply)

1. **NAVFAC SE Remedial Project Manager**

Brian Syme (Name) | RPM, NAVFAC SE (Title) | 07/07/2014 (Date)

Meeting ☐ at site ☐ at office ☐ by phone Phone no. (904) 542-6151

Site status, adjacent activities, suggestions: ☐ Report attached

2. **NAS Key West Environmental Division**

Chip Palm (Name) | IRP Manager, NAS Key West (Title) | 06/02/2014 (Date)

Meeting ☐ at site ☐ at office ☐ by phone Phone no. (305) 797-4461

Site status, adjacent activities, suggestions: ☐ Report attached

3. **Other:**

____ (Name) | ____ (Title) | ____ (Date)

Interviewed ☐ at site ☐ at office ☐ by phone Phone no.

Adjacent activities; local facility contacts; suggestions: ☐ Report attached

4. **Local regulatory authorities and response agencies:**

Agency

Contact (Name | Title | Date | Phone No.)

Problems; regulations or policy changes; suggestions; ☐ Report attached

5. **Other interviews** (optional) ☐ Report attached.

Agency

Contact (Name | Title | Date | Phone No.)

Problems; regulations or policy changes; suggestions; ☐ Report attached

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III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **Existing Facility Documents**: ☑ N/A

❑ incident reports	❑ Readily available at Envir. Div.	☐ Up to date	☑ N/A
❑ waste mngt. Records	❑ Readily available at Envir. Div.	☐ Up to date	☑ N/A
❑ service agreements	❑ Readily available	☐ Up to date	☑ N/A

Contact Chip Palm (Name) | IRP Manager (Title) | 06/02/2014 (Date) | (305) 797-4461 (Phone No.)

Problems; regulations or policy changes; suggestions; ☐ Report attached

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2. **NAS Key West Environmental Division Records**

☑ Past activities in site area	☑ Readily available	☑ Up to date	☐ N/A
☑ Current activities in site area	☑ Readily available	☑ Up to date	☐ N/A
☑ Planned activities in site area	☑ Readily available	☑ Up to date	☐ N/A

Remarks:

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3. **Records of other activities**

☑ Readily available ☑ Up to date ☑☑ N/A

Department: Navy Remarks:

Searchable Administrative Record available via public website http://go.usa.gov/KSDJ

V. ACCESS AND LAND USE CONTROLS (reduced to potentially applicable elements)

A. **Fencing**

☑ Fencing	☐ Gates	☑ Good Condition	☐ N/A
☐ Fencing damaged/ needs maintenance		☐ Gates damaged/ needs maintenance	

Remarks:

B. **Other Access Restrictions**

☑ Signs and other security measures	☐ Location shown on site map	☐ N/A
☑ Good Condition	☐ needs maintenance	

Remarks:

C**. Institutional Controls (ICs)** (May be in the form of land use controls and deed restrictions)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented	☐ Yes	☑ No	☐ N/A
Site conditions imply ICs not being fully enforced	☐ Yes	☑ No	☐ N/A

Type of monitoring (e.g., self-reporting, drive by) Self-reporting

Frequency: quarterly

Responsible party/agency: NAS Key West Environmental Division

Contact Chip Palm (Name) | IRP Manager (Title) | 06/02/2014 (Date) | (305) 797-4461 (Phone No.)

Reporting is up-to-date	☑ Yes	☐ No	☐ N/A
Reports are verified by the lead agency	☑ Yes	☐ No	☐ N/A

Specific requirements in deed or decision documents have been met ☑ Yes ☐ No ☐ N/A

Violations have been reported ☐ Yes ☐ No ☑ N/A

Other Problems or suggestions: ☐ Report attached

2. **Adequacy** ☑ ICs are adequate ☐ ICs are inadequate ☐ N/A

Remarks:

D. **General**

1. **Vandalism/trespassing** ☐ Location shown on site map ☑ No vandalism evident

Remarks:

2. **Land use changes on site** ☑ N/A

Remarks:

3. **Land use changes off site** ☑ N/A

Remarks:

VI. GENERAL SITE CONDITIONS

A. **Roads** ☑ Applicable ☐ N/A

B. **Other Site Conditions**

VII. LANDFILL COVERS ☐ Applicable ☑ N/A

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☑ N/A

IX. GROUNDWATER REMEDIES ☐ Applicable ☑ N/A

X. OTHER REMEDIES ☐ Applicable ☑ N/A

XI. OVERALL OBSERVATIONS

A. **Implementation of the Remedy**

Described issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.)

Brian Syme – The site is fenced with appropriate signage. No issues noted during time of inspection.

B. **Adequacy of O&M** (including pre-construction communications)

Described issues and observations relating to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

Brian Syme – None

C. **Early Indicators of Potential Remedy Problems**

Described issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

Brian Syme –No issues observed during inspection.

D. **Opportunities of Optimization**

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

None

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST

I. SITE INFORMATION

Site name: SWMU 1	**Date of inspection**: December 2013
Location and Region: Boca Chica Key	**FDEP ID**: DOD_9_1041
Agency, office, or company leading the five-year review: Naval Air Station Key West	**Weather/temperature**: Sunny/ 82 ^{o}F

Remedy Includes: (Check all that apply)

- ☑ Landfill cover/containment
- ☑ Access controls
- ☑ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Other
- ☐ Surface water collection and treatment
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☐ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (Check all that apply)

1. **NAVFAC SE Remedial Project Manager**

Brian Syme (Name) | RPM, NAVFAC SE (Title) | _____ (Date)

Meeting ☐ at site ☐ at office ☐ by phone Phone no. (904) 542-6151

Site status, adjacent activities, suggestions: ☐ Report attached _____

2. **NAS Key West Environmental Division**

Chip Palm (Name) | IRP Manager, NAS Key West (Title) | 06/02/2014 (Date)

Meeting ☐ at site ☐ at office ☐ by phone Phone no. (305) 797-4461

Site status, adjacent activities, suggestions: ☐ Report attached _____

3. **Other:**

_____ (Name) | _____ (Title) | _____ (Date)

Interviewed ☐ at site ☐ at office ☐ by phone Phone no. _____

Adjacent activities; local facility contacts; suggestions: ☐ Report attached _____

4. **Local regulatory authorities and response agencies:**

Agency _____

Contact _____ (Name) _____ (Title) _____ (Date) _____ (Phone No.)

Problems; regulations or policy changes; suggestions; ☐ Report attached

5. **Other interviews** (optional) ☐ Report attached.

Agency _____

Contact _____ (Name) _____ (Title) _____ (Date) _____ (Phone No.)

Problems; regulations or policy changes; suggestions; ☐ Report attached

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **Existing Facility Documents**: ☑ N/A

❑ incident reports	❑ Readily available at Envir. Div.	☐ Up to date	☑ N/A
❑ waste mngt. Records	❑ Readily available at Envir. Div.	☐ Up to date	☑ N/A
❑ service agreements	❑ Readily available	☐ Up to date	☑ N/A

Contact: Chip Palm (Name) | IRP Manager (Title) | 06/02/2014 (Date) | (305) 797-4461 (Phone No.)

Problems; regulations or policy changes; suggestions; ☐ Report attached

2. **NAS Key West Environmental Division Records**

☑ Past activities in site area	☑ Readily available	☑ Up to date	☐ N/A
☑ Current activities in site area	☑ Readily available	☑ Up to date	☐ N/A
☑ Planned activities in site area	☑ Readily available	☑ Up to date	☐ N/A

Remarks:

3. **Records of other activities**

☑ Readily available ☑ Up to date ☐ N/A

Department: Navy Remarks:

Searchable Administrative Record available via public website http://go.usa.gov/KSDJ

V. ACCESS AND LAND USE CONTROLS (reduced to potentially applicable elements)

A. **Fencing**

☑ Fencing	☑ Gates	☑ Good Condition	☐ N/A
☐ Fencing damaged/ needs maintenance		☐ Gates damaged/ needs maintenance	

Remarks: Fencing is present along the southern boundary of the site that coincides with the NAS Key West facility boundary. Fencing is in good condition. The southern gate of the facility (used infrequently) is located along the fence line near the SWMU 1 boundary.

B. **Other Access Restrictions**

☑ Signs and other security measures	☐ Location shown on site map	☐ N/A
☑ Good Condition	☐ needs maintenance	

Remarks:

C**. Institutional Controls (ICs)** (May be in the form of land use controls and deed restrictions)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented	☐ Yes	☑ No	☐ N/A
Site conditions imply ICs not being fully enforced	☐ Yes	☑ No	☐ N/A

Type of monitoring (e.g., self-reporting, drive by): Self-reporting

Frequency: quarterly

Responsible party/agency: NAS Key West Environmental Division

Contact: Chip Palm (Name) | IRP Manager (Title) | 06/02/2014 (Date) | (305) 797-4461 (Phone No.)

Reporting is up-to-date	☑ Yes	☐ No	☐ N/A
Reports are verified by the lead agency	☑ Yes	☐ No	☐ N/A

Specific requirements in deed or decision documents have been met ☑ Yes ☐ No ☐ N/A

Violations have been reported ☐ Yes ☐ No ☑ N/A

Other Problems or suggestions: ☐ Report attached

2. **Adequacy** ☑ ICs are adequate ☐ ICs are inadequate ☐ N/A

Remarks:

D. **General**

1. **Vandalism/trespassing** ☐ Location shown on site map ☑ No vandalism evident

Remarks:

2. **Land use changes on site** ☑ N/A

Remarks:

3. **Land use changes off site** ☑ N/A

Remarks:

VI. GENERAL SITE CONDITIONS

A. **Roads** ☑ Applicable ☐ N/A

B. **Other Site Conditions**

VII. LANDFILL COVERS ☐ Applicable ☑ N/A

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☑ N/A

IX. GROUNDWATER REMEDIES

A. **Groundwater Extraction wells, pumps and pipelines** ☐ Applicable ☑ N/A

B. **Surface Water Collection Structures, Pumps, and Pipelines** ☐ Applicable ☑ N/A

C. **Treatment System** ☐ Applicable ☑ N/A

1. **Treatment**

Metals removal Oil/Water separation Bioremediation
Air Stripping Carbon adsorbers
Filters
Additive
Other

☐ Good Condition ☐ Needs maintenance
☐ Sampling ports properly marked and functional
☐ Sampling/maintenance log displayed and up to date
☐ Equipment properly identified
Quantity of groundwater treated annually_____
Quantity of surface water treated annually_____
Airflow rate_____
Other operational parameters_____

Remarks Annual performance monitoring is being performed to assess the impact of the Interim Removal Action of 1996 and 2003.

2. **Electrical enclosures and panels** (properly rated and functional)

☐ Good Condition ☐ All equipment properly operating ☐ Needs maintenance ☑ N/A

Remarks

3. **Tanks, vaults and storage vessels**

☐ Good Condition ☐ Proper secondary containment ☐ Needs maintenance ☑ N/A

Remarks

4. **Discharge Structure and appurtenances**

☐ Good Condition ☐ All equipment properly operating ☐ Needs maintenance ☑ N/A

Remarks

5. **Treatment building(s)**

☐ Good Condition ☐ Needs repair ☑ N/A ☐ Chemicals and equipment properly stored

Remarks

6. **Monitoring well(s)**

☑ Properly secured ☑ Functioning ☑ Routinely sampled ☑ Good condition

☑ All required wells located ☐ Needs repair ☐ N/A

Remarks The outer protective casing of monitoring well S1MW9 was repaired December 2013.

7. **Monitoring data**

☑ Routinely submitted on time ☑ Acceptable Quality

Remarks

8. **Monitoring data suggests:**

☑ Groundwater plume is effectively contained ☑ Contaminant concentrations are declining

Remarks

D. **Monitored Natural Attenuation** ☐ Applicable ☑ N/A

X. OTHER REMEDIES ☐ Applicable ☑ N/A

XI. OVERALL OBSERVATIONS

A. **Implementation of the Remedy**

Described issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.)

Brian Syme – Site is covered in mangroves and standing water. No issues noted during last inspection.

B. **Adequacy of O&M** (including pre-construction communications)

Described issues and observations relating to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

Brian Syme – None

C. **Early Indicators of Potential Remedy Problems**

Described issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

Brian Syme –No issues observed during inspection.

D. **Opportunities of Optimization**

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

Brian Syme – Site currently undergoing optimization of monitoring program.

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST

I. SITE INFORMATION

Site name: SWMU 2	**Date of inspection**: December 2013
Location and Region: Boca Chica Key	**FDEP ID**: DOD_9_1042
Agency, office, or company leading the five-year review: Naval Air Station Key West	**Weather/temperature**: Sunny/ 82 ^{o}F

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☑ Access controls
- ☑ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Other
- ☐ Surface water collection and treatment
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☐ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (Check all that apply)

1. **NAVFAC SE Remedial Project Manager**

Brian Syme (Name) | RPM, NAVFAC SE (Title) | 07/07/2014 (Date)

Meeting ☐ at site ☐ at office ☐ by phone Phone no. (904) 542-6151

Site status, adjacent activities, suggestions: ☐ Report attached

2. **NAS Key West Environmental Division**

Chip Palm (Name) | IRP Manager, NAS Key West (Title) | 06/02/2014 (Date)

Meeting ☐ at site ☐ at office ☐ by phone Phone no. (305) 797-4461

Site status, adjacent activities, suggestions: ☐ Report attached

3. **Other:**

Name | Title | Date

Interviewed ☐ at site ☐ at office ☐ by phone Phone no.

Adjacent activities; local facility contacts; suggestions: ☐ Report attached

4. **Local regulatory authorities and response agencies:**

Agency

Contact

Name | Title | Date | Phone No.

Problems; regulations or policy changes; suggestions; ☐ Report attached

5. **Other interviews** (optional) ☐ Report attached.

Agency

Contact

Name | Title | Date | Phone No.

Problems; regulations or policy changes; suggestions; ☐ Report attached

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **Existing Facility Documents**: ☑ N/A

❑ incident reports	❑ Readily available at Envir. Div.	☐ Up to date	☑ N/A
❑ waste mngt. Records	❑ Readily available at Envir. Div.	☐ Up to date	☑ N/A
❑ service agreements	❑ Readily available	☐ Up to date	☑ N/A

Contact: Chip Palm (Name) | IRP Manager (Title) | 06/02/2014 (Date) | (305) 797-4461 (Phone No.)

Problems; regulations or policy changes; suggestions; ☐ Report attached

2. **NAS Key West Environmental Division Records**

☑ Past activities in site area	☑ Readily available	☑ Up to date	☐ N/A
☑ Current activities in site area	☑ Readily available	☑ Up to date	☐ N/A
☑ Planned activities in site area	☑ Readily available	☑ Up to date	☐ N/A

Remarks:

3. **Records of other activities**

☑ Readily available ☑ Up to date ☐ N/A

Department: Navy Remarks:

Searchable Administrative Record available via public website http://go.usa.gov/KSDJ

V. ACCESS AND LAND USE CONTROLS (reduced to potentially applicable elements)

A. **Fencing**

☐ Fencing	☐ Gates	☐ Good Condition	☑ N/A
☐ Fencing damaged/ needs maintenance		☐ Gates damaged/ needs maintenance	

Remarks: Fencing is not present around the site as it is located within the active airfield of Boca Chica Field. Restrictive fencing exists along the perimeter of the airfield.

B. **Other Access Restrictions**

☑ Signs and other security measures	☐ Location shown on site map	☐ N/A
☑ Good Condition	☐ needs maintenance	

Remarks:

C. **Institutional Controls (ICs)** (May be in the form of land use controls and deed restrictions)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented	☐ Yes	☑ No	☐ N/A
Site conditions imply ICs not being fully enforced	☐ Yes	☑ No	☐ N/A

Type of monitoring (e.g., self-reporting, drive by): Self-reporting

Frequency: quarterly

Responsible party/agency: NAS Key West Environmental Division

Contact: Chip Palm (Name) | IRP Manager (Title) | 06/02/2014 (Date) | (305) 797-4461 (Phone No.)

Reporting is up-to-date	☑ Yes	☐ No	☐ N/A
Reports are verified by the lead agency	☑ Yes	☐ No	☐ N/A
Specific requirements in deed or decision documents have been met	☑ Yes	☐ No	☐ N/A

Violations have been reported ☐ Yes ☐ No ☑ N/A

Other Problems or suggestions: ☐ Report attached

2. **Adequacy** ☑ ICs are adequate ☐ ICs are inadequate ☐ N/A

Remarks:

D. **General**

1. **Vandalism/trespassing** ☐ Location shown on site map ☑ No vandalism evident

Remarks:

2. **Land use changes on site** ☑ N/A

Remarks:

3. **Land use changes off site** ☑ N/A

Remarks:

VI. GENERAL SITE CONDITIONS

A. **Roads** ☑ Applicable ☐ N/A

B. **Other Site Conditions**

VII. LANDFILL COVERS ☐ Applicable ☑ N/A

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☑ N/A

IX. GROUNDWATER REMEDIES ☐ Applicable ☑ N/A

A. **Groundwater Extraction wells, pumps and pipelines** ☐ Applicable ☑ N/A

1. **Pumps, wellhead plumbing, and electrical**

☐ Good Condition ☐ All required wells properly operating ☐ Needs maintenance ☑ N/A

Remarks

2. **Extraction system pipelines, valves, valve boxes, and other appurtenance**

☐ Good Condition ☐ All equipment properly operating ☐ Needs maintenance ☑ N/A

Remarks

3. **Spare parts and equipment**

☐ Good Condition ☐ All equipment properly operating ☐ Needs maintenance ☑ N/A

Remarks

B. **Surface Water Collection Structures, Pumps, and Pipelines** ☐ Applicable ☑ N/A

C. **Treatment System** ☐ Applicable ☑ N/A

1. **Treatment**

Metals removal Oil/Water separation Bioremediation
Air Stripping Carbon adsorbers
Filters
Additive
Other

☐ Good Condition ☐ Needs maintenance

☐ Sampling ports properly marked and functional

☐ Sampling/maintenance log displayed and up to date
☐ Equipment properly identified
Quantity of groundwater treated annually_____
Quantity of surface water treated annually_____
Airflow rate_____
Other operational parameters_____

Remarks Annual performance monitoring is being performed to assess the impact of the Interim Removal Action of 1996.

2. **Electrical enclosures and panels** (properly rated and functional)
☐ Good Condition ☐ All equipment properly operating ☐ Needs maintenance ☑ N/A
Remarks

3. **Tanks, vaults and storage vessels**
☐ Good Condition ☐ Proper secondary containment ☐ Needs maintenance ☑ N/A
Remarks

4. **Discharge Structure and appurtenances**
☐ Good Condition ☐ All equipment properly operating ☐ Needs maintenance ☑ N/A
Remarks

5. **Treatment building(s)**
☐ Good Condition ☐ Needs repair ☑ N/A ☐ Chemicals and equipment properly stored
Remarks

6. **Monitoring well(s)**
☑ Properly secured ☑ Functioning ☑ Routinely sampled ☑ Good condition
☑ All required wells located ☐ Needs repair ☐ N/A
Remarks

7. **Monitoring data**
☑ Routinely submitted on time ☑ Acceptable Quality
Remarks

8. **Monitoring data suggests:**
☑ Groundwater plume is effectively contained ☑ Contaminant concentrations are declining
Remarks

D. **Monitored Natural Attenuation** ☐ Applicable ☑ N/A

1. **Monitoring well(s)**
☐ Properly secured ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs repair ☑ N/A
Remarks _____

3. **Monitoring data**
☐ Routinely submitted on time ☐ Acceptable Quality

4. **Monitoring data suggests:**
☐ Groundwater plume is effectively contained ☐ Contaminant concentrations are declining

X. OTHER REMEDIES ☐ Applicable ☑ N/A

XI. OVERALL OBSERVATIONS

A. **Implementation of the Remedy**

Described issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.)

Brian Syme – Pond (lagoon) with associated ditches interior to the airfield, no structures.

Mangroves cut down to grade around the perimeter of the pond and ditches.

No issues observed during inspection.

B. **Adequacy of O&M** (including pre-construction communications)

Described issues and observations relating to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

Brian Syme – None

C. **Early Indicators of Potential Remedy Problems**

Described issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

Brian Syme –No issues observed during inspection.

D. **Opportunities of Optimization**

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

Brian Syme – Site currently undergoing optimization of monitoring program.

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST

I. SITE INFORMATION

Site name: SWMU 3	**Date of inspection**: December 2013
Location and Region: Boca Chica Key	**FDEP ID**: DOD_9_1043
Agency, office, or company leading the five-year review: Naval Air Station Key West	**Weather/temperature**: Sunny/ 82 ^{o}F

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☑ Access controls
- ☑ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Other
- ☐ Surface water collection and treatment
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☐ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (Check all that apply)

1. **NAVFAC SE Remedial Project Manager**

Brian Syme (Name) | RPM, NAVFAC SE (Title) | 07/07/2014 (Date)

Meeting ☐ at site ☐ at office ☐ by phone Phone no. (904) 542-6151

Site status, adjacent activities, suggestions: ☐ Report attached

2. **NAS Key West Environmental Division**

Chip Palm (Name) | IRP Manager, NAS Key West (Title) | 06/02/2014 (Date)

Meeting ☐ at site ☐ at office ☐ by phone Phone no. (305) 797-4461

Site status, adjacent activities, suggestions: ☐ Report attached

3. **Other:**

Name | Title | Date

Interviewed ☐ at site ☐ at office ☐ by phone Phone no.

Adjacent activities; local facility contacts; suggestions: ☐ Report attached

4. **Local regulatory authorities and response agencies:**

Agency

Contact

Name | Title | Date | Phone No.

Problems; regulations or policy changes; suggestions; ☐ Report attached

5. **Other interviews** (optional) ☐ Report attached.

Agency

Contact

Name | Title | Date | Phone No.

Problems; regulations or policy changes; suggestions; ☐ Report attached

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **Existing Facility Documents**: ☑ N/A

❑ incident reports	❑ Readily available at Envir. Div.	☐ Up to date	☑ N/A
❑ waste mngt. Records	❑ Readily available at Envir. Div.	☐ Up to date	☑ N/A
❑ service agreements	❑ Readily available	☐ Up to date	☑ N/A

Contact: Chip Palm (Name) | IRP Manager (Title) | 06/02/2014 (Date) | (305) 797-4461 (Phone No.)

Problems; regulations or policy changes; suggestions; ☐ Report attached

2. **NAS Key West Environmental Division Records**

☑ Past activities in site area	☑ Readily available	☑ Up to date	☐ N/A
☑ Current activities in site area	☑ Readily available	☑ Up to date	☐ N/A
☑ Planned activities in site area	☑ Readily available	☑ Up to date	☐ N/A

Remarks:

3. **Records of other activities**

☑ Readily available ☑ Up to date ☐ N/A

Department: Navy Remarks:

Searchable Administrative Record available via public website http://go.usa.gov/KSDJ

V. ACCESS AND LAND USE CONTROLS (reduced to potentially applicable elements)

A. **Fencing**

☐ Fencing	☐ Gates	☐ Good Condition	☑ N/A
☐ Fencing damaged/ needs maintenance		☐ Gates damaged/ needs maintenance	

Remarks: Fencing is not present around the site as it is located within the active airfield of Boca Chica Field. Restrictive fencing exists along the perimeter of the airfield.

B. **Other Access Restrictions**

☑ Signs and other security measures	☐ Location shown on site map	☐ N/A
☑ Good Condition	☐ needs maintenance	

Remarks:

C. **Institutional Controls (ICs)** (May be in the form of land use controls and deed restrictions)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented	☐ Yes	☑ No	☐ N/A
Site conditions imply ICs not being fully enforced	☐ Yes	☑ No	☐ N/A

Type of monitoring (e.g., self-reporting, drive by): Self-reporting

Frequency: quarterly

Responsible party/agency: NAS Key West Environmental Division

Contact: Chip Palm (Name) | IRP Manager (Title) | 06/02/2014 (Date) | (305) 797-4461 (Phone No.)

Reporting is up-to-date	☑ Yes	☐ No	☐ N/A
Reports are verified by the lead agency	☑ Yes	☐ No	☐ N/A
Specific requirements in deed or decision documents have been met	☑ Yes	☐ No	☐ N/A

Violations have been reported ☐ Yes ☐ No ☑ N/A

Other Problems or suggestions: ☐ Report attached

2. **Adequacy** ☑ ICs are adequate ☐ ICs are inadequate ☐ N/A

Remarks:

D. **General**

1. **Vandalism/trespassing** ☐ Location shown on site map ☑ No vandalism evident

Remarks:

2. **Land use changes on site** ☑ N/A

Remarks:

3. **Land use changes off site** ☑ N/A

Remarks:

VI. GENERAL SITE CONDITIONS

A. **Roads** ☑ Applicable ☐ N/A

B. **Other Site Conditions**

VII. LANDFILL COVERS ☐ Applicable ☑ N/A

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☑ N/A

IX. GROUNDWATER REMEDIES ☐ Applicable ☑ N/A

X. OTHER REMEDIES ☐ Applicable ☑ N/A

XI. OVERALL OBSERVATIONS

A. **Implementation of the Remedy**

Described issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.)

Brian Syme – LUC in place to prevent exposure. No issues noted during time of inspection

B. **Adequacy of O&M** (including pre-construction communications)

Described issues and observations relating to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

Brian Syme – No issues noted during time of inspection

C. **Early Indicators of Potential Remedy Problems**

Described issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

Brian Syme – None to report

D. **Opportunities of Optimization**

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

Brian Syme – Site monitoring optimized.

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST

I. SITE INFORMATION

Site name: SWMU 4	**Date of inspection**: December 2013
Location and Region: Boca Chica Key	**FDEP ID**: DOD_9_1044
Agency, office, or company leading the five-year review: Naval Air Station Key West	**Weather/temperature**: Sunny/ 82 ^{o}F

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☑ Access controls
- ☑ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Other
- ☐ Surface water collection and treatment
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☐ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (Check all that apply)

1. **NAVFAC SE Remedial Project Manager**

Brian Syme (Name) | RPM, NAVFAC SE (Title) | 07/07/2014 (Date)

Meeting ☐ at site ☐ at office ☐ by phone Phone no. (904) 542-6151

Site status, adjacent activities, suggestions: ☐ Report attached

2. **NAS Key West Environmental Division**

Chip Palm (Name) | IRP Manager, NAS Key West (Title) | 06/02/2014 (Date)

Meeting ☐ at site ☐ at office ☐ by phone Phone no. (305) 797-4461

Site status, adjacent activities, suggestions: ☐ Report attached

3. **Other:**

____ (Name) | ____ (Title) | ____ (Date)

Interviewed ☐ at site ☐ at office ☐ by phone Phone no.

Adjacent activities; local facility contacts; suggestions: ☐ Report attached

4. **Local regulatory authorities and response agencies:**

Agency

Contact (Name | Title | Date | Phone No.)

Problems; regulations or policy changes; suggestions; ☐ Report attached

5. **Other interviews** (optional) ☐ Report attached.

Agency

Contact (Name | Title | Date | Phone No.)

Problems; regulations or policy changes; suggestions; ☐ Report attached

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **Existing Facility Documents**: ☑ N/A

❑ incident reports	❑ Readily available at Envir. Div.	☐ Up to date	☑ N/A
❑ waste mngt. Records	❑ Readily available at Envir. Div.	☐ Up to date	☑ N/A
❑ service agreements	❑ Readily available	☐ Up to date	☑ N/A

Contact Chip Palm (Name) | IRP Manager (Title) | 06/02/2014 (Date) | (305) 797-4461 (Phone No.)

Problems; regulations or policy changes; suggestions; ☐ Report attached

2. **NAS Key West Environmental Division Records**

☑ Past activities in site area	☑ Readily available	☑ Up to date	☐ N/A
☑ Current activities in site area	☑ Readily available	☑ Up to date	☐ N/A
☑ Planned activities in site area	☑ Readily available	☑ Up to date	☐ N/A

Remarks:

3. **Records of other activities**

☑ Readily available ☑ Up to date ☐ N/A

Department: Navy Remarks:

Searchable Administrative Record available via public website http://go.usa.gov/KSDJ

V. ACCESS AND LAND USE CONTROLS (reduced to potentially applicable elements)

A. **Fencing**

☐ Fencing ☐ Gates ☐ Good Condition ☑ N/A

☐ Fencing damaged/ needs maintenance ☐ Gates damaged/ needs maintenance

Remarks: Fencing is not present around the site as it is located within the active airfield of Boca Chica Field. Restrictive fencing exists along the perimeter of the airfield.

B. **Other Access Restrictions**

☐ Signs and other security measures ☐ Location shown on site map ☑ N/A

☐ Good Condition ☐ needs maintenance

Remarks:

C**. Institutional Controls (ICs)** (May be in the form of land use controls and deed restrictions)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented	☐ Yes	☑ No	☐ N/A
Site conditions imply ICs not being fully enforced	☐ Yes	☑ No	☐ N/A

Type of monitoring (e.g., self-reporting, drive by) Self-reporting

Frequency: quarterly

Responsible party/agency: NAS Key West Environmental Division

Contact Chip Palm (Name) | IRP Manager (Title) | 06/02/2014 (Date) | (305) 797-4461 (Phone No.)

Reporting is up-to-date	☑ Yes	☐ No	☐ N/A
Reports are verified by the lead agency	☑ Yes	☐ No	☐ N/A

Specific requirements in deed or decision documents have been met ☑ Yes ☐ No ☐ N/A

Violations have been reported ☐ Yes ☐ No ☑ N/A

Other Problems or suggestions: ☐ Report attached

2. **Adequacy** ☑ ICs are adequate ☐ ICs are inadequate ☐ N/A

Remarks:

D. **General**

1. **Vandalism/trespassing** ☐ Location shown on site map ☑ No vandalism evident

Remarks:

2. **Land use changes on site** ☑ N/A

Remarks:

3. **Land use changes off site** ☑ N/A

Remarks:

VI. GENERAL SITE CONDITIONS

A. **Roads** ☑ Applicable ☐ N/A

B. **Other Site Conditions**

VII. LANDFILL COVERS ☐ Applicable ☑ N/A

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☑ N/A

IX. GROUNDWATER REMEDIES ☐ Applicable ☑ N/A

X. OTHER REMEDIES ☐ Applicable ☑ N/A

XI. OVERALL OBSERVATIONS

A. **Implementation of the Remedy**

Described issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.)

Brian Syme – AIMD BLDG 980 in the vicinity of the site. No issues noted during time of inspection.

B. **Adequacy of O&M** (including pre-construction communications)

Described issues and observations relating to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

Brian Syme - None

C. **Early Indicators of Potential Remedy Problems**

Described issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

Brian Syme –No issues observed during inspection.

D. **Opportunities of Optimization**

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

Brian Syme – Site monitoring optimized.

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST

I. SITE INFORMATION

Site name: SWMU 5	**Date of inspection**: December 2013
Location and Region: Boca Chica Key	**FDEP ID**: DOD_9_1045
Agency, office, or company leading the five-year review: Naval Air Station Key West	**Weather/temperature**: Sunny/ 82 ^{o}F

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☑ Access controls
- ☑ Institutional controls
- ☐ Groundwater pump and treatment
- ☑ Other — Surface Water and Sediment Annual Monitoring
- ☐ Surface water collection and treatment
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☐ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (Check all that apply)

1. **NAVFAC SE Remedial Project Manager**

Brian Syme (Name) | RPM, NAVFAC SE (Title) | 07/07/2014 (Date)

Meeting ☐ at site ☐ at office ☐ by phone Phone no. (904) 542-6151

Site status, adjacent activities, suggestions: ☐ Report attached

2. **NAS Key West Environmental Division**

Chip Palm (Name) | IRP Manager, NAS Key West (Title) | 06/02/2014 (Date)

Meeting ☐ at site ☐ at office ☐ by phone Phone no. (305) 797-4461

Site status, adjacent activities, suggestions: ☐ Report attached

3. **Other:**

Name | Title | Date

Interviewed ☐ at site ☐ at office ☐ by phone Phone no.

Adjacent activities; local facility contacts; suggestions: ☐ Report attached

4. **Local regulatory authorities and response agencies:**

Agency

Contact

Name | Title | Date | Phone No.

Problems; regulations or policy changes; suggestions; ☐ Report attached

5. **Other interviews** (optional) ☐ Report attached.

Agency

Contact

Name | Title | Date | Phone No.

Problems; regulations or policy changes; suggestions; ☐ Report attached

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III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **Existing Facility Documents**: ☑ N/A

❑ incident reports	❑ Readily available at Envir. Div.	☐ Up to date	☑ N/A
❑ waste mngt. Records	❑ Readily available at Envir. Div.	☐ Up to date	☑ N/A
❑ service agreements	❑ Readily available	☐ Up to date	☑ N/A

Contact Chip Palm (Name) | IRP Manager (Title) | 06/02/2014 (Date) | (305) 797-4461 (Phone No.)

Problems; regulations or policy changes; suggestions; ☐ Report attached

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2. **NAS Key West Environmental Division Records**

☑ Past activities in site area	☑ Readily available	☑ Up to date	☐ N/A
☑ Current activities in site area	☑ Readily available	☑ Up to date	☐ N/A
☑ Planned activities in site area	☑ Readily available	☑ Up to date	☐ N/A

Remarks:

3. **Records of other activities**

☑ Readily available ☑ Up to date ☐ N/A

Department: Navy Remarks:

Searchable Administrative Record available via public website http://go.usa.gov/KSDJ

V. ACCESS AND LAND USE CONTROLS (reduced to potentially applicable elements)

A. **Fencing**

☐ Fencing	☐ Gates	☐ Good Condition	☑ N/A
☐ Fencing damaged/ needs maintenance		☐ Gates damaged/ needs maintenance	

Remarks:

B. **Other Access Restrictions**

☑ Signs and other security measures	☐ Location shown on site map	☐ N/A
☑ Good Condition	☐ needs maintenance	

Remarks:

C. **Institutional Controls (ICs)** (May be in the form of land use controls and deed restrictions)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented	☐ Yes	☑ No	☐ N/A
Site conditions imply ICs not being fully enforced	☐ Yes	☑ No	☐ N/A

Type of monitoring (e.g., self-reporting, drive by) Self-reporting

Frequency: quarterly

Responsible party/agency: NAS Key West Environmental Division

Contact Chip Palm (Name) | IRP Manager (Title) | 06/02/2014 (Date) | (305) 797-4461 (Phone No.)

Reporting is up-to-date	☑ Yes	☐ No	☐ N/A
Reports are verified by the lead agency	☑ Yes	☐ No	☐ N/A

Specific requirements in deed or decision documents have been met ☑ Yes ☐ No ☐ N/A

Violations have been reported ☐ Yes ☐ No ☑ N/A

Other Problems or suggestions: ☐ Report attached

2. **Adequacy** ☑ ICs are adequate ☐ ICs are inadequate ☐ N/A

Remarks:

D. **General**

1. **Vandalism/trespassing** ☐ Location shown on site map ☑ No vandalism evident

Remarks:

2. **Land use changes on site** ☑ N/A

Remarks:

3. **Land use changes off site** ☑ N/A

Remarks:

VI. GENERAL SITE CONDITIONS

A. **Roads** ☑ Applicable ☐ N/A

B. **Other Site Conditions**

VII. LANDFILL COVERS ☐ Applicable ☑ N/A

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☑ N/A

IX. GROUNDWATER REMEDIES ☐ Applicable ☑ N/A

X. OTHER REMEDIES ☐ Applicable ☑ N/A

XI. OVERALL OBSERVATIONS

A. **Implementation of the Remedy**

Described issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.)

Brian Syme –No issues observed during inspection.

B. **Adequacy of O&M** (including pre-construction communications)

Described issues and observations relating to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

Brian Syme – None

C. **Early Indicators of Potential Remedy Problems**

Described issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

Brian Syme –No issues observed during inspection.

D. **Opportunities of Optimization**

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

Brian Syme – Site currently undergoing optimization of monitoring program.

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST

I. SITE INFORMATION

Site name: SWMU 7	**Date of inspection**: December 2013
Location and Region: Boca Chica Key	**FDEP ID**: DOD_9_1047
Agency, office, or company leading the five-year review: Naval Air Station Key West	**Weather/temperature**: Sunny/ 82 ^{o}F

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☑ Access controls
- ☑ Institutional controls
- ☐ Groundwater pump and treatment
- ☑ Other — Surface Water and Sediment Annual Monitoring
- ☐ Surface water collection and treatment
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☐ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (Check all that apply)

1. **NAVFAC SE Remedial Project Manager**

Brian Syme (Name) | RPM, NAVFAC SE (Title) | 07/07/2014 (Date)

Meeting ☐ at site ☐ at office ☐ by phone Phone no. (904) 542-6151

Site status, adjacent activities, suggestions: ☐ Report attached

2. **NAS Key West Environmental Division**

Chip Palm (Name) | IRP Manager, NAS Key West (Title) | 06/02/2014 (Date)

Meeting ☐ at site ☐ at office ☐ by phone Phone no. (305) 797-4461

Site status, adjacent activities, suggestions: ☐ Report attached

3. **Other:**

(Name) | (Title) | (Date)

Interviewed ☐ at site ☐ at office ☐ by phone Phone no.

Adjacent activities; local facility contacts; suggestions: ☐ Report attached

4. **Local regulatory authorities and response agencies:**

Agency

Contact — Name | Title | Date | Phone No.

Problems; regulations or policy changes; suggestions; ☐ Report attached

5. **Other interviews** (optional) ☐ Report attached.

Agency

Contact — Name | Title | Date | Phone No.

Problems; regulations or policy changes; suggestions; ☐ Report attached

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III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **Existing Facility Documents**: ☑ N/A

❑ incident reports	❑ Readily available at Envir. Div.	☐ Up to date	☑ N/A
❑ waste mngt. Records	❑ Readily available at Envir. Div.	☐ Up to date	☑ N/A
❑ service agreements	❑ Readily available	☐ Up to date	☑ N/A

Contact Chip Palm (Name) | IRP Manager (Title) | 06/02/2014 (Date) | (305) 797-4461 (Phone No.)

Problems; regulations or policy changes; suggestions; ☐ Report attached

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2. **NAS Key West Environmental Division Records**

☑ Past activities in site area	☑ Readily available	☑ Up to date	☐ N/A
☑ Current activities in site area	☑ Readily available	☑ Up to date	☐ N/A
☑ Planned activities in site area	☑ Readily available	☑ Up to date	☐ N/A

Remarks:

3. **Records of other activities**

☑ Readily available ☑ Up to date ☐ N/A

Department: Navy Remarks:

Searchable Administrative Record available via public website http://go.usa.gov/KSDJ

V. ACCESS AND LAND USE CONTROLS (reduced to potentially applicable elements)

A. **Fencing**

☑ Fencing	☑ Gates	☑ Good Condition	☐ N/A
☐ Fencing damaged/ needs maintenance		☐ Gates damaged/ needs maintenance	

Remarks:

B. **Other Access Restrictions**

☑ Signs and other security measures	☐ Location shown on site map	☐ N/A
☑ Good Condition	☐ needs maintenance	

Remarks:

C**. Institutional Controls (ICs)** (May be in the form of land use controls and deed restrictions)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented	☐ Yes	☑ No	☐ N/A
Site conditions imply ICs not being fully enforced	☐ Yes	☑ No	☐ N/A

Type of monitoring (e.g., self-reporting, drive by) Self-reporting

Frequency: quarterly

Responsible party/agency: NAS Key West Environmental Division

Contact Chip Palm (Name) | IRP Manager (Title) | 06/02/2014 (Date) | (305) 797-4461 (Phone No.)

Reporting is up-to-date	☑ Yes	☐ No	☐ N/A
Reports are verified by the lead agency	☑ Yes	☐ No	☐ N/A

Specific requirements in deed or decision documents have been met ☑ Yes ☐ No ☐ N/A

Violations have been reported ☐ Yes ☐ No ☑ N/A

Other Problems or suggestions: ☐ Report attached

2. **Adequacy** ☑ ICs are adequate ☐ ICs are inadequate ☐ N/A

Remarks:

D. **General**

1. **Vandalism/trespassing** ☐ Location shown on site map ☑ No vandalism evident

Remarks:

2. **Land use changes on site** ☑ N/A

Remarks:

3. **Land use changes off site** ☑ N/A

Remarks:

VI. GENERAL SITE CONDITIONS

A. **Roads** ☑ Applicable ☐ N/A

B. **Other Site Conditions**

VII. LANDFILL COVERS ☐ Applicable ☑ N/A

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☑ N/A

IX. GROUNDWATER REMEDIES ☐ Applicable ☑ N/A

X. OTHER REMEDIES ☐ Applicable ☑ N/A

XI. OVERALL OBSERVATIONS

A. **Implementation of the Remedy**

Described issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.)

Brian Syme – Storage facility next to pond obscured with mangrove trees and vegetation.

No issues observed during inspection.

B. **Adequacy of O&M** (including pre-construction communications)

Described issues and observations relating to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

Brian Syme – None

C. **Early Indicators of Potential Remedy Problems**

Described issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

Brian Syme –No issues observed during inspection.

D. **Opportunities of Optimization**

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

Brian Syme – Site currently undergoing optimization of monitoring program.

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST

I. SITE INFORMATION

Site name: SWMU 9	**Date of inspection**: December 2013
Location and Region: Boca Chica Key	**FDEP ID**: DOD_9_1049
Agency, office, or company leading the five-year review: Naval Air Station Key West	**Weather/temperature**: Sunny/82 ^{o}F

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☑ Access controls
- ☑ Institutional controls
- ☑ Groundwater pump and treatment
- ☐ Other
- ☐ Surface water collection and treatment
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☐ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (Check all that apply)

1. **NAVFAC SE Remedial Project Manager**

Brian Syme (Name) | RPM, NAVFAC SE (Title) | 07/07/2014 (Date)

Meeting ☐ at site ☐ at office ☐ by phone Phone no. (904) 542-6151

Site status, adjacent activities, suggestions: ☐ Report attached

2. **NAS Key West Environmental Division**

Chip Palm (Name) | IRP Manager, NAS Key West (Title) | 06/02/2014 (Date)

Meeting ☐ at site ☐ at office ☐ by phone Phone no. (305) 797-4461

Site status, adjacent activities, suggestions: ☐ Report attached

3. **Other:**

Name | Title | Date

Interviewed ☐ at site ☐ at office ☐ by phone Phone no.

Adjacent activities; local facility contacts; suggestions: ☐ Report attached

4. **Local regulatory authorities and response agencies:**

Agency

Contact

Name | Title | Date | Phone No.

Problems; regulations or policy changes; suggestions; ☐ Report attached

5. **Other interviews** (optional) ☐ Report attached.

Agency

Contact

Name | Title | Date | Phone No.

Problems; regulations or policy changes; suggestions; ☐ Report attached

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III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **Existing Facility Documents**: ☑ N/A

❑ incident reports	❑ Readily available at Envir. Div.	☐ Up to date	☑ N/A
❑ waste mngt. Records	❑ Readily available at Envir. Div.	☐ Up to date	☑ N/A
❑ service agreements	❑ Readily available	☐ Up to date	☑ N/A

Contact Chip Palm (Name) | IRP Manager (Title) | 06/02/2014 (Date) | (305) 797-4461 (Phone No.)

Problems; regulations or policy changes; suggestions; ☐ Report attached

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2. **NAS Key West Environmental Division Records**

☑ Past activities in site area	☑ Readily available	☑ Up to date	☐ N/A
☑ Current activities in site area	☑ Readily available	☑ Up to date	☐ N/A
☑ Planned activities in site area	☑ Readily available	☑ Up to date	☐ N/A

Remarks:

3. **Records of other activities**

☑ Readily available ☑ Up to date ☐ N/A

Department: Navy Remarks:

Searchable Administrative Record available via public website http://go.usa.gov/KSDJ

V. ACCESS AND LAND USE CONTROLS (reduced to potentially applicable elements)

A. **Fencing**

☐ Fencing	☐ Gates	☐ Good Condition	☑ N/A
☐ Fencing damaged/ needs maintenance		☐ Gates damaged/ needs maintenance	

Remarks:

B. **Other Access Restrictions**

☑ Signs and other security measures	☐ Location shown on site map	☐ N/A
☑ Good Condition	☐ needs maintenance	

Remarks:

C. **Institutional Controls (ICs)** (May be in the form of land use controls and deed restrictions)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented	☐ Yes	☑ No	☐ N/A
Site conditions imply ICs not being fully enforced	☐ Yes	☑ No	☐ N/A

Type of monitoring (e.g., self-reporting, drive by) Self-reporting

Frequency: quarterly

Responsible party/agency: NAS Key West Environmental Division

Contact Chip Palm (Name) | IRP Manager (Title) | 06/02/2014 (Date) | (305) 797-4461 (Phone No.)

Reporting is up-to-date	☑ Yes	☐ No	☐ N/A
Reports are verified by the lead agency	☑ Yes	☐ No	☐ N/A

Specific requirements in deed or decision documents have been met ☑ Yes ☐ No ☐ N/A

Violations have been reported ☐ Yes ☐ No ☑ N/A

Other Problems or suggestions: ☐ Report attached

2. **Adequacy** ☑ ICs are adequate ☐ ICs are inadequate ☐ N/A

Remarks:

D. **General**

1. **Vandalism/trespassing** ☐ Location shown on site map ☑ No vandalism evident

Remarks:

2. **Land use changes on site** ☑ N/A

Remarks:

3. **Land use changes off site** ☑ N/A

Remarks:

VI. GENERAL SITE CONDITIONS

A. **Roads** ☑ Applicable ☐ N/A

B. **Other Site Conditions**

VII. LANDFILL COVERS ☐ Applicable ☑ N/A

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☑ N/A

IX. GROUNDWATER REMEDIES

A. **Groundwater Extraction wells, pumps and pipelines** ☐ Applicable ☑ N/A

B. **Surface Water Collection Structures, Pumps, and Pipelines** ☐ Applicable ☑ N/A

C. **Treatment System** ☐ Applicable ☑ N/A

1. **Treatment**

Metals removal
Air Stripping
Filters
Additive
Other

Oil/Water separation
Carbon adsorbers

Bioremediation

☐ Good Condition ☐ Needs maintenance
☐ Sampling ports properly marked and functional
☐ Sampling/maintenance log displayed and up to date
☐ Equipment properly identified
Quantity of groundwater treated annually_____
Quantity of surface water treated annually_____
Airflow rate_____
Other operational parameters_____

Remarks Annual performance monitoring is being performed to assess the impact of the Enhanced Biodegradation injection program from 2001.

2. **Electrical enclosures and panels** (properly rated and functional)

☐ Good Condition ☐ All equipment properly operating ☐ Needs maintenance ☑ N/A

Remarks

3. **Tanks, vaults and storage vessels**
☐ Good Condition ☐ Proper secondary containment ☐ Needs maintenance ☑ N/A
Remarks

4. **Discharge Structure and appurtenances**
☐ Good Condition ☐ All equipment properly operating ☐ Needs maintenance ☑ N/A
Remarks

5. **Treatment building(s)**
☐ Good Condition ☐ Needs repair ☑ N/A ☐ Chemicals and equipment properly stored
Remarks

6. **Monitoring well(s)**
☑ Properly secured ☑ Functioning ☑ Routinely sampled ☑ Good condition
☑ All required wells located ☐ Needs repair ☐ N/A

Remarks

7. **Monitoring data**
☑ Routinely submitted on time ☑ Acceptable Quality
Remarks

8. **Monitoring data suggests:**
☑ Groundwater plume is effectively contained ☑ Contaminant concentrations are declining
Remarks

D. **Monitored Natural Attenuation** ☐ Applicable ☑ N/A

X. OTHER REMEDIES ☐ Applicable ☑ N/A

XI. OVERALL OBSERVATIONS

A. **Implementation of the Remedy**

Described issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.)

Brian Syme – LUCs prevent contact with groundwater. No issues observed during inspection.

B. **Adequacy of O&M** (including pre-construction communications)

Described issues and observations relating to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

Brian Syme –No issues observed during inspection.

C. **Early Indicators of Potential Remedy Problems**

Described issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

Brian Syme –No issues observed during inspection.

D. **Opportunities of Optimization**

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

Brian Syme – Site currently undergoing optimization of monitoring program.

APPENDIX D

RESPONSES TO COMMENTS ON THE DRAFT FIVE-YEAR REVIEW

REVISED RESPONSE TO COMMENTS (February 19, 2016)
Draft Five-Year Review of Sites IR1, IR3, IR 7, IR 8, IR 21 and AOC B, and RCRA Part B Permit Corrective Action Effectiveness Evaluation of Sites SWMU 1, SWMU 2, SWMU 3, SWMU 5, SWMU 7, and SWMU 9, Naval Air Station Key West, Key West, Florida

Comment Number	Page/Section Numbers	Comments by: Tracie Vaught (FDEP)	Response
General Comment 1.	Page iv 1st bullet Page iv	The subject document states the following: *"According to the DDs and SOBs for the sites, the groundwater at NAS Key West is nonpotable and should qualify for the GIII classification under Florida Administrative Code (FAC) Chapter 62-520. The groundwater is "poor quality" for purposes of determining appropriate cleanup target levels (CTLs) under FAC 62-777. The NAS Key West Partnering Team (DoN, EPA, and Florida Department of Environmental Protection [FDEP]) should consider adopting less-stringent groundwater criteria in place of currently-used drinking water criteria."*	The first bullet on page iv will be deleted. Further discussions on the subject are warranted for future partnering team meetings. **FDEP Response: This comment has been addressed**.
		While the groundwater at NAS Key West may have characteristics that would qualify it for GIII classification, that classification has not been assigned. Pursuant to Chapter 62-520.400 of the Florida Administrative Code (F.A.C.) Groundwater Classes Standards and Exemptions, states the following: *(1) All ground water shall at all places and at all times be free from domestic, industrial, agricultural, or other man-induced non-thermal components of discharges in concentrations which, alone or in combination with other substances, or components of discharges (whether thermal or non-thermal* *(a) Are harmful to plants, animals, or organisms that are native to the soil and responsible for treatment or stabilization of the discharge relied upon by Department permits; or* *(b) Are carcinogenic, mutagenic, teratogenic, or toxic to human beings, unless specific criteria are established for such components in Rule 62-520.420, F.A.C.; or* *(c) Are acutely toxic within surface waters affected by the ground water; or* *(d) Pose a serious danger to the public health, safety, or welfare; or* *(e) Create or constitute a nuisance; or* *(f) Impair the reasonable and beneficial use of adjacent waters.*	
		The Navy may want to consider using the low yield/poor quality provision in Chapter 62-780.680(2)(c)1. of the F.A.C.	

Comment Number	Page/Section Numbers	Comments by: Tracie Vaught (FDEP)	Response
		The Navy also has the option of using the Department's guidance for determining groundwater background criteria on a site by site basis. The guidance that can be found at the following hyperlink: https://www.dep.state.fl.us/waste/quick_topics/publications/wc/GroundwaterBackgroundGuidance2013.pdf	
1.	General Comment regarding the recommendation to discontinue sampling for the landfill sites, (IR 1, IR 7, IR 8, and SWMU 1)	The Department cannot concur with the recommendation to discontinue groundwater monitoring for these landfill sites. However, the Department would consider reducing the frequency of sampling events, decreasing the contaminants of concern monitored and evaluating the potential for closure of each site after reviewing the groundwater and surface water data with the Tier I Team.	The recommendations for the landfill sites will be revised to state that sampling should be reduced to a quinquennial basis to support future five year reviews with the exception of groundwater at SWMU 1 (see SWMU 1 comment response below). **FDEP Response: This comment has been addressed, with the understanding that the next 5 year cycle will start in 2016, see general comment at the end of the table for an explanation.**
2.	Page 58, SWMU 1 Boca Chica Open Disposal Area, Section 3.1.7, Recommendations and Follow-up Actions	The Department cannot concur with the recommendation to discontinue groundwater sampling at this site. The only well that is monitored at this site is a sentinel well, which is approximately 30 feet from the closest marine surface water body. Over the last five years, this well has consistently exhibited arsenic at concentrations ranging from 120 µg/l to 140 µg/l. These concentrations exceed both groundwater cleanup target levels (GCTLs) and the surface water cleanup target level (SWCTL) of 50 µg/l pursuant to Chapter 62-777 of the F.A.C.	The recommendation for SWMU 1 will be revised to state that sampling should be reduced to a quinquennial basis to support future five year reviews for surface water and sediment. An additional recommendation will be provided for SWMU 1 that states "the partnering team should develop an investigation to further evaluate the arsenic exceedance in groundwater near monitoring well S1MW-07." **FDEP Response: This comment has been addressed, with the understanding that the next 5 year cycle will start in 2016, see general comment at the end of the table for an explanation.**
3.	Page 70, SWMU 2, Section 3.2.7 Recommendations and Follow-up Actions	The Navy is recommending discontinuing monitoring of all environmental media at this site. The Department does not concur for the following reasons: An investigation was conducted post hurricane Wilma to determine if the flooding from the hurricane had effected any of the site boundaries for SWMU 2. Both pesticides and metals were found at concentrations that exceeded the applicable SWCTLs and Sediment Quality Assessment Guidelines (SQAGs) pursuant to 62-777 of the F.A.C. Based on the 2007 sampling event, the SWMU 2 site boundaries were expanded to address contamination attributable to this site. The Navy states that these surface water bodies do not need to be sampled because they were not sampled during the	It is not clear from the comments, specific to SWMU 2, whether FDEP agrees with the Navy's conclusion that the remedy is protective. Specifically, the statement: "The implementation of the remedy has not fully addressed the environmental contamination" would suggest that FDEP does NOT agree the remedy is protective. However, the selected remedy for SWMU 2 is Land Use Controls (LUCs) and monitoring, which itself would suggest that contamination remains onsite. After reviewing the most recent 2014 Annual Performance Monitoring Report it appears that there is very little contamination present in either the groundwater or surface water. In fact, there are no PQL exceedances of either metals or pesticides in the groundwater. Copper exceeds surface water criteria at one sampling location, only in 2014, while all other contaminants are either non-detect or below PQLs. The sediment concentrations continue to be greater than SQAGs, as noted

Comment Number	Page/Section Numbers	Comments by: Tracie Vaught (FDEP)	Response
		original remedial investigation, which took place in 1994. The Department does not concur with this assumption because the adjacent surface water bodies are connected to the site through storm water ditches and the surface water bodies are part of the expanded site. While an interim removal action was completed in 1996, as demonstrated in this report, groundwater, surface water and sediment samples collected within the original site boundaries still exhibit concentrations of pesticides and/or metals above both SQAGs and SWCTLs. The implementation of the remedy has not fully addressed the environmental contamination for SWMU 2. Further, the surface water bodies included in the expanded site boundaries should be monitored during future sampling events. **FDEP Response: The Department does not concur with the Navy's response to this site's recommendation to changing the sampling plan for this site. However, we do concur with changing the sampling to every 5 years that will start in 2016, see general comment at the end of the table for an explanation.**	in the comment, but the Navy understands SQAGs to be "guidance" and are not cleanup goals nor do they represent "unacceptable risk". In order to evaluate protectiveness of the remedy there needs to be a clear link between the chemicals of concern that lead to an unacceptable risk and then whether the remedy is addressing this unacceptable risk. It is the Navy's opinion, based on site conditions and Team actions during the last 15 years, that there is no unacceptable ecological risk at SWMU 2. The 1996 Interim Removal Action (IRA) of sediment from the ditch as well as surrounding soil was intended to remove the most highly pesticide contaminated sediment. The IRA of sediment was performed by installing coffer dams at each end of the ditch, dewatering the ditch, followed by sediment removal. The RFI points out that contaminated sediment was allowed to remain on either side of these coffer dams. It seems clear that the entire Team agreed early on to allow environmental contamination to remain at SWMU 2 and that removing the highest concentrations was the goal. Remedial Action Objectives (RAOs) and the ecological receptors the remedy is intended to protect needs to be evaluated by not only examining SWMU 2 specifically but also evaluating SWMU 2 in the context of the surrounding area. One has only to look at the "lagoon" and drainage ditches that make up SWMU 2 on a map to see that they are obviously man made drainage features to ensure the airfield is well drained. The fact that the topography in the surrounding area is flat, that an airfield needs to be elevated to ensure adequate drainage and the necessity for a low spot to collect the water supports the idea that this "lagoon" and drainage ditch were made by excavating these areas for "fill material". These drainage features should not be evaluated as highly valuable habitat. To illustrate this fact, SWMU 2 lies directly between two active runways. The "lagoon" and ditch drains the entire airfield terminating at a significant distance at the open waters of Florida. NAS Key West in an active base that host a large number of squadrons that utilize the runways on a frequent basis. The constant use of this airfield further degrades any value this area might be as suitable habitat. RAOs are not clearly documented in the Statement of Basis (SOB) but can be reasonably inferred by the actions the Team has taken before and after the SOB was implemented. The SOB requires that groundwater, surface water and sediment be collected but how the results should be used to evaluate protectiveness is lacking. Unlike many areas of the SOB that lack specific detail one section specifically points out, "Because source of pesticides has been

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			removed from SWMU 2, long-term biomonitoring of pesticides in fish would be appropriate to ensure concentrations decrease over time." This statement would suggest the Team was not specifically concerned with the fish themselves, after all they were surviving, but pesticides in fish tissue could magnify up the food chain. Therefore, fish tissue would be used as a surrogate to evaluate the potential that pesticides could accumulate in piscivorous birds that might feed in this area. It should be pointed out that in 2003 the Team agreed to discontinue fish tissue sampling. Please note that IF the intent of the IRA was to remove ALL sediment contaminated with pesticides that continued monitoring of sediment, surface water and fish tissue for these analytes would not be necessary. It is clear that from the very beginning the Team accepted the fact that sediment remained greater than SQAGs and to suggest that they should now be met is unsupported by previous decisions including a monitoring only remedy. It is the Navy's position that site management should be consistent with site location and conditions – man made drainage features adjacent to an active airfield. Considering that SWMU 2 is in the middle of an active airfield there is a far greater risk of a bird being struck by an aircraft than the potential of being impacted by the ingestion of fish containing pesticides. To highlight this all but real scenario, the NAS Key West environmental director conveyed a story to the partnering team that a bald eagle had attempted to capture a rabbit near SWMU 2 and was struck and killed by a passing aircraft. In fact, the Navy has a BASH program with the sole purpose of discouraging birds from inhabiting airfields where they present a real risk to not only aircraft but human lives. Therefore, the concentration in fish tissue should not be a driving factor in determining the protectiveness of the remedy at SWMU 2. One could propose that the elevated sediment concentrations could pose an unacceptable risk to the benthic community. However there are several lines of evidence that clearly demonstrate protection of the benthic community is not an RAO at SWMU 2. Risk to the benthic community is not mentioned in the SOB. Sediment that exceeded criteria (SQAGs) for pesticides was allowed to remain in place on either side of the coffer dams. Clearly this has the potential to pose an unacceptable risk to the benthic community and yet was allowed to remain. The IRA removed the sediment down to caprock (benthic habitat) which

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			removed the habitat in which they live. The fact that Navy and FDEP has not had an issue in 15 years of sampling, based on a lack of remedy change, would suggest Team approval of a risk management decision. The SOB states "Because source of pesticides has been removed from SWMU 2, long-term biomonitoring of pesticides in fish would be appropriate to ensure concentrations decrease over time." Because biomonitoring does nothing to be protective of any receptor, one can only conclude that the Navy and FDEP agreed that pesticides in sediment posed no unacceptable risk. The Team has accepted any potential risk as "acceptable" for a number of years based on both current and previous actions as well as the selected remedy – monitoring. The fact that contaminated sediment was allowed to remain after the IRA suggest that the benthic community was not a receptor that was being protected. Fish tissue monitoring, which has been discontinued, is not a remedy to protect these receptors but would be a way to evaluate the potential for bioaccumulation of pesticides in pisciverous birds and whether additional active remediation might be required. However, the Navy has a BASH program that deters these very birds from foraging in this area, as well as the fact that the site is used heavily by Navy aircraft, which would pose a much greater risk to these birds. Therefore, the remaining contamination present at SWMU 2 does not pose an unacceptable ecological risk to the only receptor the remedy is intending to protect and that is the pisciverous birds. The Navy is proposing to continue implementing LUCs at SMWU 2 in order to continue protecting human health. The Navy would also like to propose that when the land use changes and SWMU 2 is no longer in the midst of an active airfield that the potential risk be re-evaluated and remedy selection re-examined. However, while the airfield is active and the BASH program is underway that continued annual monitoring of surface water, sediment and groundwater be discontinued.

REVISED RESPONSE TO COMMENTS (February 19, 2016)
Draft Five-Year Review of Sites IR1, IR3, IR 7, IR 8, IR 21 and AOC B, and RCRA Part B Permit Corrective Action Effectiveness Evaluation of Sites SWMU 1, SWMU 2, SWMU 3, SWMU 5, SWMU 7, and SWMU 9, Naval Air Station Key West, Key West, Florida

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4.	Page 80, SWMU 5, Boca Chica AIMD Building A-990 Sand Blasting Area, Section 3.4.7, Recommendations and Follow-up Actions	The Department cannot concur with the Navy's recommendation to discontinue the sediment and surface water sampling for this site due to the exceedances of cobalt in both the sediment and surface water samples. However, the Department will consider a proposal to reduce the frequency of future sampling events	The recommendations for SWMU 5 will be revised to state that sampling should be reduced to a quinquennial basis to support future five year reviews. **FDEP Response: This comment has been addressed, with the understanding that the next 5 year cycle will start in 2016, see general comment at the end of the table for an explanation.**
5.	Page 87, SWMU 7, Boca Chica Temporary Hazardous Waste Storage Area, Section 3.4.7, Recommendations and Follow-up Actions	The Department cannot concur with Navy's recommendation to discontinue the sediment and surface water sampling for this site due to the exceedances of copper and manganese in both the sediment and surface water samples. However, the Department will consider a proposal to reduce the frequency of future sampling events.	The recommendations for SWMU 7 will be revised to state that sampling should be reduced to a quinquennial basis to support future five year reviews. **FDEP Response: This comment has been addressed, with the understanding that the next 5 year cycle will start in 2016, see general comment at the end of the table for an explanation.**

1. **General Comment: The laboratory did not attain the prescribed detection limits identified in the Uniform Federal Policy-Sampling and Analysis Plan (UFP-SAP) for the chemicals that were analyzed for this annual 2014 sampling event. The method detection limits were elevated causing the detection limits to exceed regulatory criteria for the contaminants of concern. Thus, the data is likely of questionable value. The Department will not be making regulatory decisions on data that is suspect.**