Final May 2011 and October 2011 Performance Monitoring Data Summary Report

AOC 9
Former Griffiss Air Force Base
Rome, New York

Contract No. W912DQ-09-D-3013

April 2013

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Certificate of Compliance

Final
May 2011 and October 2011 Performance Monitoring Data Summary Report
AOC 9
Former Griffiss Air Force Base, Rome, New York

April 2013

On behalf of Ecology and Environment Engineering, P.C. (EEEPC), the undersigned certify that the attached document(s) were developed in conformance with EEEPC's Scope of Work, contract requirements, and EEEPC's Quality Control Plan.

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Table of Contents

Section **Page**

1 Introduction 1-1
1.1 Purpose of Investigation 1-1
1.2 AOC 9 Site Description 1-2
1.3 AOC 9 Previous Investigation Background 1-3
1.4 AOC 9 Remedial Design and Monitoring Summary 1-6

2 AOC 9 Performance Monitoring Activities 2-1
2.1 Scope of Work 2-1
2.1.1 Monitoring Well Installation and Development 2-2
2.1.2 Groundwater Sampling 2-2
2.1.3 Surface Water Sampling 2-2
2.1.4 Groundwater Elevation Measurements 2-3
2.2 Equipment Decontamination 2-3
2.3 Investigation Derived Waste 2-3
2.4 Quality Assurance/Quality Control 2-4
2.5 Site Survey 2-5
2.6 Work Plan Deviations 2-5

3 AOC 9 Performance Monitoring Findings 3-1
3.1 May 2011 Performance Monitoring 3-1
3.1.1 Groundwater Sampling Results 3-1
3.1.2 Surface Water Sampling Results 3-2
3.1.3 MAROS and Trend Analysis 3-3
3.1.4 May 2011 Summary 3-5
3.2 October 2011 Performance Monitoring 3-6
3.2.1 Groundwater Sampling Results 3-6
3.2.2 Surface Water Sampling Results 3-8
3.2.3 MAROS and Trend Analysis 3-8
3.2.4 October 2011 Summary and Recommendations 3-12
3.2.5 Effectiveness of Remedy 3-13

4 References 4-1

Table of Contents (cont.)

Appendix		Page
A	AOC 9-MW19 Drilling Log and Well Development Record	A-1
B	AOC 9-MW19 Survey Data	B-1
C	Disposal Manifest Form	C-1
D	Daily Activity Forms	D-1
E	Sampling Forms	E-1
F	Photolog	F-1
G	Analytical Data	G-1
H	Data Usability Summary Report	H-1
I	Field Adjustment Forms	I-1
J	MAROS	J-1

List of Tables

Table		Page
1-1	AOC 9 Groundwater Cleanup Goals/Remedial Action Objectives	1-8
2-1	AOC 9 Performance Monitoring, Groundwater and Surface Water Sample Summary, Former Griffiss Air Force Base, Rome, New York	2-7
2-2	AOC 9 Performance Monitoring Groundwater Elevation Data, Former Griffiss Air Force Base, Rome, New York	2-8
3-1a	AOC 9 May 2011 Performance Monitoring, Summary of Positive Results for Groundwater Samples, Former Griffiss Air Force Base, Rome, NY	3-14
3-1b	AOC 9 October 2011 Performance Monitoring, Summary of Positive Results for Groundwater Samples, Former Griffiss Air Force Base, Rome, NY	3-15
3-2a	AOC 9 May 2011 Performance Monitoring, Summary of Positive Results for Surface Water Samples, Former Griffiss Air Force Base Rome, NY	3-16
3-2b	AOC 9 October 2011 Performance Monitoring, Summary of Positive Results for Surface Water Samples, Former Griffiss Air Force Base Rome, NY	3-16
3-3	AOC 9 Historic Groundwater Sample Results	3-17
3-4	AOC 9 Historic Surface Water Sample Results	3-27

List of Figures

Figure		Page
1-1	AOC 9, Former Griffiss Air Force Base, Rome, New York	1-9
1-2	2010 Baseline Monitoring Total Volatile Organic Compound Concentrations in Groundwater and Surface Water	1-11
2-1	Performance Monitoring Sample Location Map	2-11
2-2a	AOC 9: Groundwater Contour Map May 17, 2011	2-13
2-2b	AOC 9: Groundwater Contour Map October 24, 2011	2-15
3-1a	May 2011 Performance Monitoring Total Volatile Organic Compound Concentrations in Groundwater and Surface Water	3-29
3-1b	October 2011 Performance Monitoring Total Volatile Organic Compound Concentrations in Groundwater and Surface Water	3-31
3-2	AOC9 Performance Monitoring, Chlorobenzene Plume	3-33
3-3	AOC9 Performance Monitoring, TCE Plume	3-35
3-4	AOC 9 Performance Monitoring, Total DCB Plume	3-37
3-5	AOC9-MW06 Trend Analysis	3-39
3-6	AOC9-MW14 Trend Analysis	3-41
3-7	AOC9-MW15 Trend Analysis	3-43
3-8	AOC9-MW17 Trend Analysis	3-45
3-9	AOC9-MW19 Trend Analysis	3-47

List of Abbreviations and Acronyms

AFCEE	Air Force Center for Engineering and the Environment
AOC 9	Area of Concern 9
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylene
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
COC	contaminant of concern
DCB	dichlorobenzene
DCE	dichloroethylene
DO	dissolved oxygen
DUSR	Data Usability Summary Report
EEEPC	Ecology and Environment Engineering, P.C.
EPA	(United States) Environmental Protection Agency
ERPIMS	Environmental Restoration Program Information Management System
ESI	Expanded Site Investigation
FID	flame ionization detector
Griffiss AFB	former Griffiss Air Force Base
MAROS	Monitoring and Remediation Optimization System Software Version 2.2
MCL	maximum contaminant level
µg/L	micrograms per liter
mg/kg	milligrams per kilogram
MW	monitoring well
NTU	nephelometric turbidity unit

List of Abbreviations and Acronyms (cont.)

NYSDEC	New York State Department of Environmental Conservation
ORP	oxidation reduction potential
Parsons	Parsons Infrastructure & Technology Group, Inc.
PCE	tetrachloroethylene
PDI	Predesign Investigation
PDI 2	Second Predesign Investigation
PID	photoionization detector
ppm	parts per million
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
RAO	remedial action objective
SI	Supplemental Investigation
SW	surface water
TCE	trichloroethylene
USACE	United States Army Corps of Engineers
VOC	volatile organic compound
WSA	Weapons Storage Area

1 Introduction

Ecology and Environment Engineering, P.C. (EEEPC), under contract to Parsons Infrastructure & Technology Group, Inc. (Parsons), which is under contract to the U.S. Army Corps of Engineers (USACE) Kansas City District (Contract No. W912DQ-09-D-3013), performed the first and second rounds of performance groundwater and surface water monitoring at Area of Concern 9 (AOC 9) of the former Griffiss Air Force Base (Griffiss AFB) in Rome, New York on May 17 and 18, 2011 and October 24 and 25, 2011 (see Figure 1-1).

1.1 Purpose of Investigation

The three-phased groundwater monitoring program consists of baseline, performance, and long-term monitoring of volatile organic compound (VOC) levels in the groundwater and in Six Mile Creek. A phased approach is consistent with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) response action process. Monitoring well data are screened against the most stringent of either the New York State Department of Environmental Conservation (NYSDEC) Class GA groundwater criteria or the United States Environmental Protection Agency (EPA) maximum contaminant levels (MCLs) (NYSDEC 2009; EPA 2006), which also represent the remedial action objectives (RAOs) established in the *Final Record of Decision* for this project (see Table 1-1; EEEPC 2010a). However, the NYSDEC Class GA criteria for groundwater contaminants of concern (COCs) at AOC 9 are the more stringent of the screening criteria. Surface water samples are screened against the NYSDEC Class C freshwater fish propagation standards and guidance values (NYSDEC 2009).

The baseline sampling conducted from July 27 to 29, 2010, consisted of groundwater sampling of eight monitoring wells (G009-MW01, G009-MW02, AOC9-MW05, MW06, MW14, MW15, MW17, and MW18) and surface water sampling of three locations (AOC9-SW01, SW02, and SW03). These groundwater and surface water samples were analyzed to establish baseline VOC concentrations in the groundwater plume and Six Mile Creek before remediation began (EEEPC 2010c).

The performance monitoring will evaluate the short-term effectiveness of the remediation efforts with a total of four sampling events over two years. The performance monitoring consists of groundwater sampling of five monitoring wells (AOC9-MW06, MW14, MW15, MW17, and MW19) and surface water sampling of three locations (AOC9-SW01, SW02, and SW03). The first and second sam-

pling events are presented here, identified as the May 2011 and October 2011 performance monitoring.

The long-term effectiveness of the remediation efforts will be monitored during the long-term monitoring for three more years with annual sampling events. The long-term monitoring consists of groundwater sampling of nine monitoring wells (G009-MW01, G009-MW02, AOC9-MW05, MW06, MW14, MW15, MW17, MW18, and MW19) and surface water sampling of three locations (AOC9-SW01, SW02, and SW03).

Following the first three years of annual long-term monitoring, it is anticipated that monitoring will continue on an every-other-year basis until concentrations of hazardous substances in groundwater are below the RAOs. Once the RAOs have been reached, the monitoring will again be performed annually until three consecutive rounds of sampling indicate that the concentrations of groundwater contaminants remain below RAOs. At that point, unrestricted use of the site may be allowed. Modeling performed during evaluation of the remedial alternatives for AOC 9 indicated that the total duration of the remedial action would likely span 11 years beginning in 2011 with the implementation of the remedial action (EEEPC 2010d).

1.2 AOC 9 Site Description

AOC 9 is a grass-covered area approximately 1,500 feet long and 650 feet wide located in the southwest portion of the inactive Weapons Storage Area (WSA; see Figure 1-1). The site is part of a strip of land that lies between an airplane runway to the southwest and extends into the WSA to the northeast. Perimeter Road runs through the site and Six Mile Creek borders the southwestern edge of the site.

The area comprising AOC 9 was originally farmland in the 1930s before the base was constructed. In the 1940s and 1950s, the first landfill for the base was established beneath the northern portion of the WSA extending south between Perimeter Road and Six Mile Creek. Aerial photographs show that the landfill was active between 1943 and 1957 but no later than 1960. The type of material buried at this site is unknown; however, it is reported that large quantities of the landfill material were removed during construction of the WSA.

Two munitions storage bunkers were erected between Perimeter Road and Six Mile Creek in the early 1950s. One of the bunkers (also referred to as igloos) was removed in the late 1970s or early 1980s (before 1981), and the other bunker was removed in 1992. Although the bunkers were initially used for munitions storage, they were later used to store hazardous materials.

The site's status was changed from "Area of Interest" to "Area of Concern" in 1998 when groundwater samples collected during the Expanded Site Investigation (ESI) were found to contain chlorinated solvents at concentrations exceeding NYSDEC Class GA standards and EPA MCLs (EPA 2006; NYSDEC 2009).

AOC 9 is currently inactive and access is somewhat restricted by Perimeter Road Gates 4 and 11. The southern portion of this area is expected to remain vacant in the future, acting as a buffer zone between the runway and future development in adjacent areas. The northern portion of the site extends into the former WSA boundary and is expected to be zoned as a nonresidential, industrial area.

The ground surface at AOC 9 slopes gently downward toward Six Mile Creek. Groundwater flows southwest toward the creek. Depth to groundwater is approximately 10 to 12 feet but is closer to the ground surface between Perimeter Road and Six Mile Creek. There are several locations in this area where shallow groundwater discharges to the surface. Three intermittent drainage ways that discharge to Six Mile Creek exist on the southern portion of the site.

Debris (e.g., glass, slag, bricks, ceramics, cinderblocks, asphalt, concrete, wire, and metal) encountered during test pit excavations in the southern portion of the former landfill (south of the WSA) accounted for less than 1% by volume of excavated material. The lack of waste materials observed from the test pit excavations support reports that the contents of the former WSA landfill had been removed before the WSA was built.

A contaminated groundwater plume (chlorobenzene, trichloroethylene [TCE], dichloroethylene [DCE]) extends downgradient from AOC 9 for approximately 1,500 feet and covers approximately 8 acres. The lateral extent of the plume is approximately 400 feet and the vertical extent range is from ground surface to approximately 20 feet below ground surface (bgs). The leading edge of the plume has reached Six Mile Creek.

The contaminated aquifer is composed of silty-fine to medium grained sands with little coarse sand with discontinuous gravel seams. North of Perimeter Road, the aquifer is found in an interval from approximately 3 to 28 feet bgs. South of Perimeter Road there is less overburden and the aquifer extends from 1 to 18 feet bgs. A thin till layer above the Utica Shale bedrock underlies the aquifer, but contamination has not been detected in the bedrock.

1.3 AOC 9 Previous Investigation Background

In 1997, an ESI was performed (E & E 1998). The main objective of the ESI was to investigate the nature and extent of environmental contamination from historical releases at the site in order to determine whether any remedial action was necessary to prevent potential threats to human health and the environment arising from exposure to site conditions.

The ESI included the installation and sampling of four permanent monitoring wells. Analytical results indicated the presence of benzene, chlorobenzene, cis-1,2-DCE, 1,2-dichlorobenzene (DCB), 1,3-DCB, 1,4-DCB, tetrachloroethylene (PCE), and TCE in one or more wells in concentrations that exceeded screening criteria. Several metals, including aluminum, iron, manganese, and potassium,

were also detected in concentrations that exceeded screening criteria in one or more wells.

In 2000, a Supplemental Investigation (SI) was performed. A total of 88 Geoprobe and six Hydropunch groundwater screening samples were collected from 45 locations. Twenty-six of the 45 locations were vertically profiled (i.e., up to three samples were collected from different depths at the same location). In addition, four new monitoring wells were installed and sampled, and four existing monitoring wells were resampled. Analytical results for the Geoprobe/ Hydropunch samples indicated the presence of 16 VOCs at levels exceeding the most stringent criteria. Analytical results for the monitoring wells indicated the presence of 14 VOCs and five metals at concentrations exceeding the most stringent screening criteria.

In 2002, a second SI was performed to collect additional data to further delineate the chlorinated hydrocarbon plume and determine if petroleum hydrocarbons were present within the groundwater. A total of 56 Geoprobe groundwater screening samples were collected from 14 locations. Eleven of the 14 locations were vertically profiled (i.e., up to five samples were collected from different depths at the same location). Analytical results for the Geoprobe samples indicated the presence of 15 VOCs at levels exceeding the most stringent screening criteria.

Based on these results, the overall shape of the contaminant plume at that time appeared to be linear and oriented northeast/southwest (approximately 850 feet long) with a relatively narrow center. The downgradient portion appeared to be the widest due to natural dispersion and the change in direction of groundwater flow in proximity to the creeks. Subsequent investigations provided additional data to better define the entire plume.

During the SI, five test pits were excavated to the water table and groundwater samples were collected to determine if petroleum hydrocarbons were present within the groundwater. Analytical results indicated that there was no significant petroleum hydrocarbon contamination in the test pit samples.

During the first predesign investigation (PDI) conducted in September through November 2006 by EEEPC, four additional groundwater monitoring wells (MWs; AOC9-MW14 through MW17) were installed at the site. Twenty-three different VOCs were detected in at least one of the groundwater samples collected during this investigation. The highest concentrations of total VOCs (1, 2-DCB, 1, 4-DCB, chlorobenzene, and benzene) were detected in presumed upgradient wells MW14 and MW15 at 2,082 micrograms per liter (µg/L) and 1,989 µg/L, respectively. These concentrations at presumed upgradient wells prompted further investigation and a potential source of groundwater contamination was found in the soil upgradient of Six Mile Creek and Perimeter Road. Two additional PDIs were conducted to determine the extent and nature of this source.

The second predesign investigation (PDI 2) was performed in February through April 2007. This study included the installation of 25 temporary monitoring wells and identified areas containing significantly higher levels of chlorobenzene and related compounds east of Building 913. Monitoring wells TW39 and TW32 had chlorobenzene concentrations of 14,400 µg/L and 8,580 µg/L, respectively. These concentrations were five to 10 times higher than the highest concentrations historically detected at AOC 9.

A third predesign investigation (Additional PDI) was performed in June through October 2007 to better define the plume and further identify the potential soil contaminant source area. During this investigation, a total of 56 new temporary monitoring wells were installed around the site. Twenty-two different VOCs were detected in the groundwater samples collected from the temporary monitoring wells at concentrations exceeding the groundwater standards. The highest total VOC concentrations were detected in groundwater samples collected from temporary wells TW45 (3,100 µg/L), TW71 (3,300 µg/L), and TW100 (3,400 µg/L). In addition, 42 boreholes were installed in the soil and soil cores were screened continuously with a photoionization detector and flame ionization detector (PID/FID) from ground surface to refusal (in the glacial till layer, approximately between 20 and 30 feet bgs). Samples were taken at depth intervals where the highest PID/FID readings were measured. Twelve VOCs (1, 2, 4-trimethylbenzene, 1, 3, 5-trimethylbenzene, 1, 2-DCB, 1, 3-DCB, 1, 4-DCB, chlorobenzene, ethylbenzene, naphthalene, n-butylbenzene, n-propylbenzene, sec-butylbenzene, and toluene) were detected at concentrations exceeding screening criteria in the soil samples collected from the 42 soil borings. The highest total VOC concentrations were detected in soil samples collected from boreholes SB01 (1,100 milligrams/kilogram [mg/kg]) and SB12 (1,600 mg/kg) with chlorobenzenes representing the largest fraction of VOCs. The sample results and field observations indicated that there was a 6-foot-thick gray to black smear zone of contamination at the top of the saturated zone, which is located at depths ranging from 8 to 17 feet bgs.

Based on the above PDIs, the soil east of Building 913 was identified as the source of the AOC 9 groundwater contamination.

Baseline sampling was conducted at AOC 9 from July 27 to July 29, 2010, to establish baseline VOC concentrations in the groundwater plume and Six Mile Creek, before the remedial action (source excavation) began on September 1, 2010 and are presented in the *Final Baseline Monitoring Data Summary Report, AOC 9 Former Griffiss Air Force Base, Rome, New York* (EEEPC 2010c). Baseline sampling consisted of sampling eight monitoring wells (G009-MW01, G009-MW02, AOC9-MW05, MW06, MW14, MW15, MW17, and MW18) and three surface water (SW) locations (AOC9-SW01, SW02, and SW03). Groundwater and surface water samples were analyzed for VOCs (EPA Method SW8260B).

Twenty-one VOCs, including chlorobenzene; 1, 2-DCB; 1, 4-DCB; TCE; PCE; and several compounds containing benzene, toluene, ethylbenzene, and xylene

(BTEX) were detected in the groundwater samples collected. Eleven of the contaminants were detected in at least one sample at concentrations exceeding NYSDEC Class GA Groundwater standards. The highest total VOC concentrations were detected in monitoring wells MW14 (2,100 µg/L), MW15 (1,700 µg/L), and MW17 (890 µg/L). Monitoring wells MW14, MW15, and MW17 are located in the center of the plume downgradient of the contaminant source area (see Figure 1-2).

A comparison of baseline analytical results to the historical analytical results indicated that the AOC 9 groundwater plume had, in general, remained relatively stable. Based on the analytical results obtained from monitoring wells MW01 and MW02, the plume did not appear to have widened south of Perimeter Road, nor does the leading edge of the plume appear to have continued to advance based on the analytical results obtained from monitoring wells MW05 and MW06. Surface water sample results obtained from sample locations SW01, SW02, and SW03 have also been relatively consistent. The upstream location (SW01) has had total VOC concentrations ranging from non-detect to 1.78 µg/L. The location where the center of the groundwater contaminant plume intersects Six Mile Creek (SW02) has had total VOC concentrations ranging from non-detect to 5 µg/L, and sample location SW03, at the downstream edge of the groundwater plume's intersection with Six Mile Creek has had total VOC concentrations ranging from non-detect to 4 µg/L.

1.4 AOC 9 Remedial Design and Monitoring Summary

The remedial design includes removal of the source area through excavation of contaminated soil, which was completed in December 2010, treatment of contaminated groundwater using chemical oxidation, which is currently scheduled for completion in 2013, and land use controls (EEEPC 2010d). Additionally, three groundwater and surface water monitoring phases, baseline sampling, performance monitoring, and long-term monitoring, will be performed in conjunction with the remedial action as described in the *Final Work Plan Baseline, Performance, and Long-Term Monitoring at AOC 9* (EEEPC 2010e). Baseline sampling was conducted to provide a snapshot of the groundwater contaminant levels prior to implementation of the remedial action for comparison to the groundwater monitoring, which will be performed after the remedial action. The May 2011 and October 2011 performance monitoring events, as presented here, were performed to evaluate the short-term effectiveness of the remediation efforts; by being used to confirm the downward trend during the first two years following excavation, and evaluate which of the RAOs have been or have not been achieved, for each of the monitoring wells sampled. The subsequent two performance monitoring events will also evaluate the short-term effectiveness of the remediation efforts. The long-term monitoring will be performed to monitor the long-term effectiveness of the remediation efforts.

As described in the work plan, a total of eight sampling events are currently planned: one baseline sampling, four biannual performance monitoring, and three annual long-term monitoring. However, following the first three years of annual

long-term monitoring, it is anticipated that monitoring will continue on an every-other-year basis until concentrations of hazardous substances in groundwater are below RAOs. After reaching the RAOs, the monitoring will again be performed annually until three consecutive rounds of sampling indicate that the concentrations of groundwater contaminants remain below the RAOs, allowing for unrestricted use of the site (EEEPC 2010e). If an increasing trend in contaminants of concern concentration is identified in any monitoring well or surface water sampling location (e.g., three consecutive monitoring events showing a statistically increasing trend), the Air Force will propose to the EPA and NYSDEC that additional action be performed. Additional oxidant injections or additional excavations may be executed without requiring either an Explanation of Significant Differences or ROD amendment (EEEPC 2010a).

Activities at this site included installation and development of two new permanent monitoring wells (AOC9-MW18 and MW19). Monitoring well MW18 was installed by Parsons, prior to the baseline sampling, east of the treatment area and serves as an upgradient well (see Figure 2-1 for well locations). Total VOC concentration during baseline sampling in MW18 was 3.2 µg/L. The remedial action at AOC 9 was conducted following the installation of MW18. Well MW19 was installed in the spring 2011, prior to the May 2011 performance sampling, following the remedial excavation in the eastern portion of the groundwater contaminant source area at the location of former temporary well TW39 (see Figure 2-1 for well locations, Appendix A for well installation documentation, and Appendix B for survey data). The screened interval in MW19 targets the interval previously screened by temporary well TW39 (9.3 to 19.3 feet bgs), which contained a total VOC concentration of 21,610 µg/L. MW19 was constructed with a 10-foot (0.01-inch slot) PVC screen in accordance with USACE protocols.

Table 1-1 AOC 9 Groundwater Cleanup Goals/Remedial Action Objectives

Contaminants of Concern[a]	Groundwater Cleanup Goal[b] (µg/L)
1,2-Dichlorobenzene	3
1,2-Dichloroethane	0.6
1,2,4-Trimethylbenzene	5
1,3,5-Trimethylbenzene	5
1,3-Dichlorobenzene	3
1,4-Dichlorobenzene	3
Acetone	50
Benzene	1
Chlorobenzene	5
cis-1,2-Dichloroethylene	5
Ethylbenzene	5
Isopropylbenzene	5
Methylene Chloride	5
Naphthalene	10
n-Butylbenzene	5
n-Propylbenzene	5
o-Xylene	5
sec-Butylbenzene	5
Trichloroethylene	5
tert-Butylbenzene	5
Tetrachloroethylene	5
Vinyl Chloride	2
Xylene (Total)	5

Notes:

[a] From the *Final Feasibility Study Addendum for AOC 9* (EEEPC 2010b).

[b] New York State Department of Environmental Conservation (NYSDEC 2009) Class GA groundwater standard.

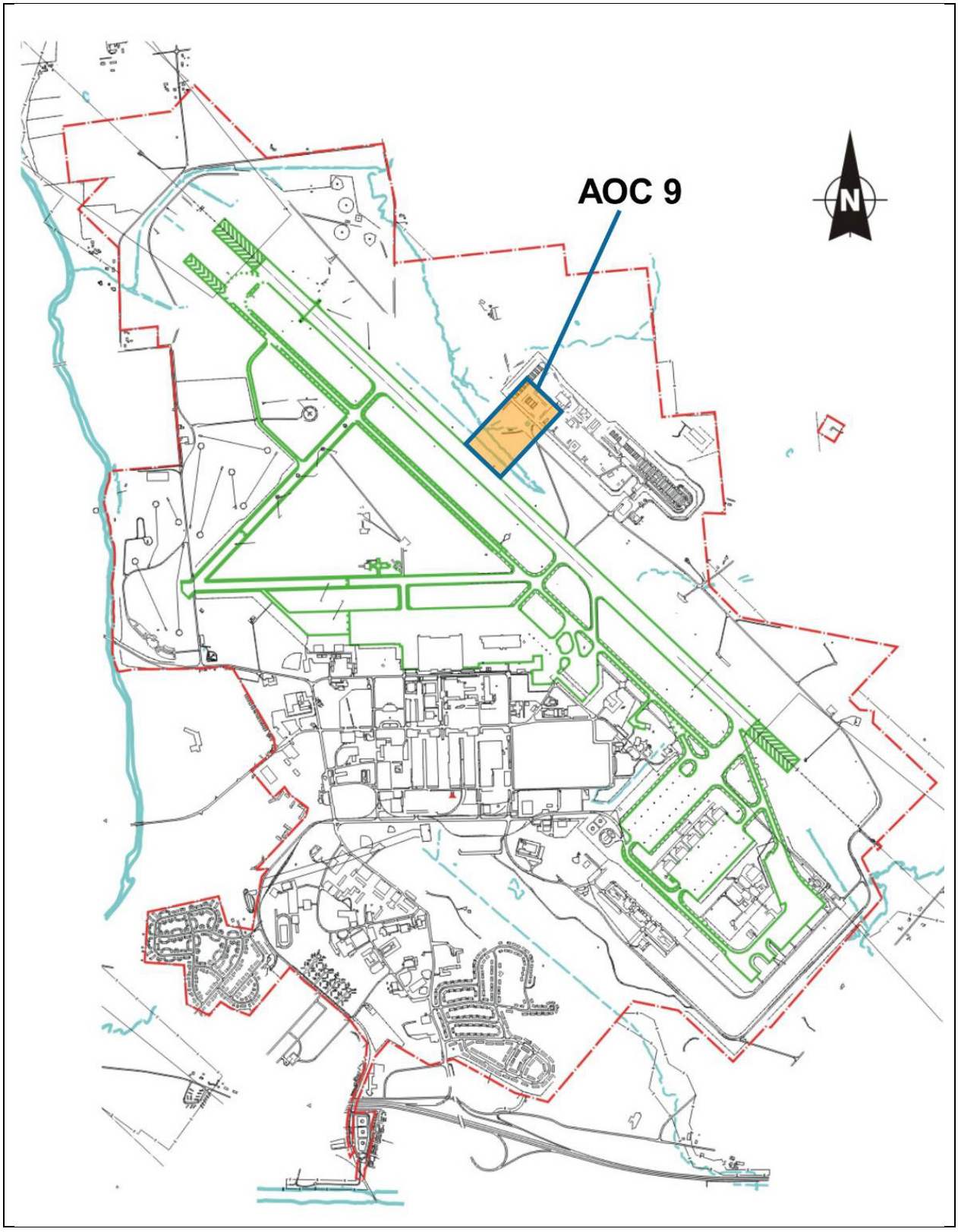
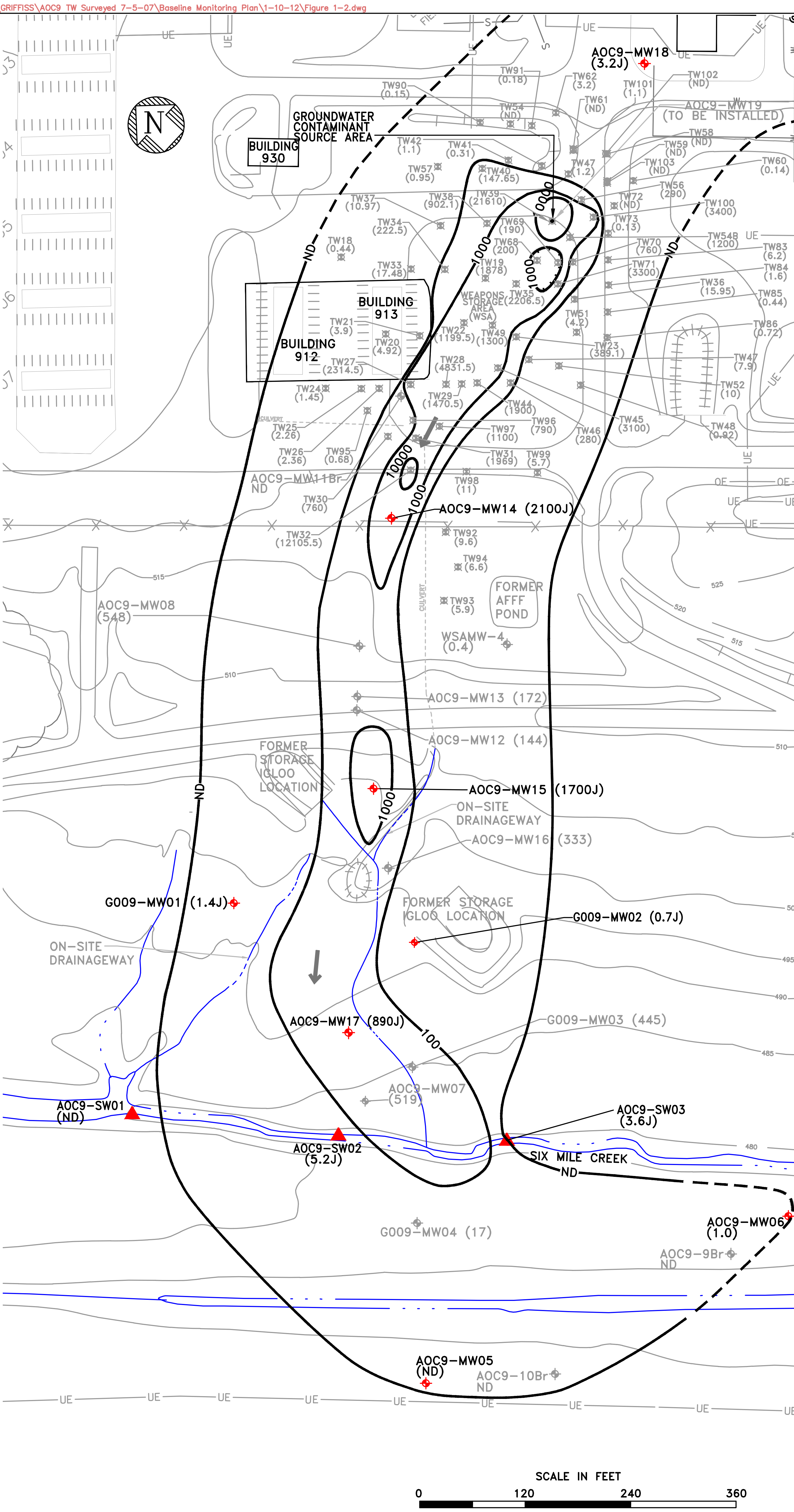


Figure 1-1 AOC 9, Former Griffiss Air Force Base, Rome, New York

F:\GRIFFISS\AOC9 TW Surveyed 7-5-07\Baseline Monitoring Plan\1-10-12\Figure 1-2.dwg



LEGEND

525	TOPOGRAPHIC CONTOUR LINE (CONTOUR INTERVAL = 5 FT)
ND	NOT DETECTED
10000	TOTAL VOC CONTOUR IN ug/L (DASHED WHERE INFERRED)
AOC9-MW14	BASELINE MONITORING WELL SAMPLE LOCATION
AOC9-MW08 (548)	EXISTING WELL WITH HISTORIC TOTAL VOC CONCENTRATION IN GROUNDWATER (ug/L), SEE NOTES BELOW
(140)	2010 BASELINE SAMPLING TOTAL VOC CONCENTRATION IN GROUNDWATER AND SURFACE WATER (ug/L)
→	GROUNDWATER FLOW DIRECTION
▲	SURFACE WATER SAMPLING LOCATIONS
TW99 (5.7)	2006 AND 2007 PREDESIGN TEMPORARY MONITORING WELL TOTAL VOC CONCENTRATION IN GROUNDWATER (ug/L)

NOTES:

1. MONITORING WELL AOC9-MW19 WAS INSTALLED AFTER THE BASELINE MONITORING AND REMEDIAL EXCAVATION WERE PERFORMED.
2. WHEN DUPLICATE SAMPLES ARE COLLECTED, THE HIGHEST VALUE OBTAINED IS USED ON THIS FIGURE.
3. TOTAL VOC CONCENTRATIONS IN GROUNDWATER FOR:
   - AOC9-MW03, MW04, MW07, MW08 MW12, AND MW16 ARE SAMPLES COLLECTED DURING THE ON-BASE GROUNDWATER BASELINE SAMPLING IN 2006.
   - BEDROCK MONITORING WELLS AOC9-9Br, 10Br, AND 11Br ARE FROM SAMPLES COLLECTED DURING THE BEDROCK GROUNDWATER STUDY IN 2002.
   - MONITORING WELLS AOC9-MW13 AND WSAMW-4 ARE FROM SAMPLES COLLECTED IN 2004 DURING BASEWIDE GROUNDWATER MONITORING.

FORMER GRIFFISS AFB
AOC 9 SITE
ROME, NEW YORK

Prepared by:
ecology and environment engineering p.c.
In association with:
parsons

DRAWING TITLE: AOC 9
2010 BASELINE MONITORING TOTAL VOLATILE ORGANIC COMPOUND CONCENTRATIONS IN GROUNDWATER AND SURFACE WATER

FIGURE 1-2

2 AOC 9 Performance Monitoring Activities

This section presents the field activities performed during the AOC 9 May 2011 and October 2011 Performance Monitoring (see Appendix D, Daily Activity Forms). The work performed at AOC 9 described in this report was performed in accordance with the work plan (EEEPC 2010e), with minor deviations from the work plan described in Section 2.6.

2.1 Scope of Work

May 2011 and October 2011 performance sampling was conducted at AOC 9 in accordance with the work plan after the remedial excavation was completed to evaluate the effectiveness of the remediation efforts on VOC concentrations in the groundwater plume and Six Mile Creek (EEEPC 2010e). Performance sampling consisted of sampling five monitoring wells (AOC9-MW06, MW14, MW15, MW17, and MW19) and three SW locations (AOC9-SW01, SW02, and SW03; see Figure 2-1):

- Well MW06 was sampled as a sentinel well to determine the stability of the leading edge of the contaminant plume and to monitor the effectiveness of the remedial action in the area downgradient of the remedial action treatment area.
- Wells MW14, MW15 and MW17 were sampled to monitor the groundwater quality in the center of the plume downgradient of the remedial excavation.
- Well MW19 was sampled to monitor the effectiveness of the remedial action in the center of the former source area, following completion of the source area excavation.
- Surface water sample locations SW01 through SW03 were sampled to monitor contaminant concentrations within Six Mile Creek.

May 2011 and October 2011 performance sampling results will be used to begin to evaluate the effectiveness of the remediation efforts. Sampling was conducted from May 17 to 18, 2011 and October 24 to 25, 2011.

2.1.1 Monitoring Well Installation and Development

One additional groundwater monitoring well (MW19) was installed on April 7, 2011, by Atlantic Testing Laboratories under contract to Parsons, in the excavation area at the former location of temporary well TW39, to function as a former source area well (see Figure 2-1). Monitoring well MW19 was installed 19 feet deep and constructed with a 10-foot (0.01-inch slot) PVC screen. MW19 was installed adjacent to the roadway in AOC 9, and completed with a flush-mount protective casing to limit potential damage from vehicle traffic.

Monitoring well MW19 was developed on April 14, 2011. The development was performed by using a dedicated bailer and peristaltic pump with dedicated tubing. The pump intake was moved to different depth intervals within the screen to draw fine sediments out of the sand pack and into the well for removal, and the bailer was used to surge the well. Temperature, pH, conductivity, and turbidity measurements were recorded to monitor the progress of the development process. Development was performed until pH, specific conductance, and temperature stabilized over three consecutive readings and turbidity of the discharge was less than 50 nephelometric turbidity units (NTUs). The drilling log and development record for MW19 are included in Appendix A.

2.1.2 Groundwater Sampling

Groundwater samples were collected from MW06, MW14, MW15, MW17, and MW19 and analyzed by Katahdin Analytical Services, located in Scarborough, Maine. Groundwater samples were analyzed for VOCs (EPA Method SW8260B), in accordance with the *Final Work Plan, Baseline, Performance, and Long-Term Monitoring at AOC 9* (EEEPC 2010e). Prior to collection of the groundwater samples, a minimum of three well volumes of groundwater was purged from each well using EPA low-flow procedures. The wells were purged and sampled with a pump/controller and dedicated bladder pumps and associated tubing. Field parameters (i.e., turbidity, pH, temperature, conductivity, oxidation reduction potential [ORP], and dissolved oxygen [DO]) were collected and recorded on groundwater sampling forms during purging. The completed groundwater sampling forms are provided in Appendix E and a complete list of all samples collected is provided in Table 2-1. Static water levels were also measured and recorded for each monitoring well listed on Table 2-2 to create a current groundwater contour map (see Figures 2-2a and 2-2b). A photograph of each groundwater sample collected is provided in Appendix F in accordance with USACE protocols.

2.1.3 Surface Water Sampling

Surface water samples were collected from SW01 through SW03, and analyzed by Katahdin Analytical Services. Surface water samples were analyzed for VOCs (EPA Method SW8260B), in accordance with the work plan (EEEPC 2010e). The samples were collected by filling a dedicated sample jar with water directly from Six Mile Creek, then transferring the creek water to pre-preserved approved sample containers, leaving no head space. Field parameters (i.e., turbidity, pH, temperature, conductivity, ORP, and DO) were collected and recorded during

sampling. The completed surface water sampling forms are provided in Appendix E and a complete list of all samples collected is provided in Table 2-1.

2.1.4 Groundwater Elevation Measurements

Groundwater elevations were collected in accordance with the work plan (EEEPC 2010e) by measuring the depth to water at 16 locations (see Table 2-2) using an electronic water level indicator to measure the static water levels from the top of the casing at each location. These measurements were used to create a current groundwater contour map (see Figures 2-2a and b). MW19 was surveyed in the fall 2011 in accordance with the work plan. Survey data is provided as Appendix B and the groundwater contour map (see Figure 2-2b) has been updated to reflect this and the October 2011 performance monitoring event.

2.2 Equipment Decontamination

Equipment decontamination was performed in accordance with the work plan (EEEPC 2010e).

Groundwater and surface water field testing instruments were decontaminated by rinsing the water level indicator, flow-through cell and pH, temperature, conductivity, DO, and ORP probes with deionized water between each use.

The drill rig and all appurtenances were decontaminated by the drilling subcontractor with high-pressure steam prior to arrival on the site. All equipment was decontaminated again upon arrival to the site to remove road dirt only, and prior to leaving the site, all equipment was decontaminated with high-pressure steam.

The drilling subcontractor constructed a decontamination pad of wood and plastic sheeting that was bermed on all sides and included a high-pressure steam cleaner and a sump for water collection and pumping. Pallets were used to keep equipment to be decontaminated off the floor of the pad.

2.3 Investigation Derived Waste

Investigation-derived water was handled in accordance with the work plan (EEEPC 2010e). Purge water generated during groundwater sampling was collected in 5-gallon buckets and field-screened with a PID to determine if it was contaminated. PID readings were taken directly from the surface of the collected purge water. No PID readings above zero parts per million (ppm) were detected from the field screening of the purge water; therefore, all water was discharged to the ground adjacent to the sampled well.

Investigation-derived soils and water generated during installation of MW19 were screened in the field using a PID to determine whether these wastes were contaminated. PID readings from all the soil cuttings, decontamination water, and development water generated were less than 5 ppm. However, the soil and water generated was temporarily containerized in a 55-gallon drum on site and was later disposed of by Clean Harbors El Dorado LLC, on November 30, 2011. The disposal manifest is provided in Appendix C.

2.4 Quality Assurance/Quality Control

Quality assurance/quality control (QA/QC) samples were collected for each site in accordance with the work plan (EEEPC 2010e). Analytical data have been validated for samples collected as part of this investigation. Raw data and the Data Usability Summary Report (DUSR) are presented in Appendices G and H, respectively.

Field QC samples included one groundwater duplicate and one trip blank during the May 2011 sampling event, and one groundwater duplicate, one trip blank, and one equipment rinsate blank during the October 2011 sampling event. Duplicate samples provide insight as to the homogeneity of the sample matrix and establish a degree of confidence that the sample represents site conditions. Field duplicates were collected at the rate of one duplicate per 10 original samples (10%); therefore, one duplicate was collected for the five ground and three surface water samples collected. The field duplicates collected during May 2011 showed good precision, with the exception of isopropylbenzene, which had a relative percent difference out of QC criteria and was qualified as estimated in the duplicate and parent samples. The field duplicate collected during October 2011 showed good precision, with the exception of benzene, cyclohexane, ethylbenzene, and isopropylbenzene, which had a relative percent difference out of QC criteria and were qualified as estimated in the duplicate and parent samples.

A trip blank was collected to establish that the transport of sample containers to and from the field did not result in the contamination of the sample from external sources. Acetone and 1,4-Dioxane were detected in the May 2011 trip blank, acetone was qualified as non-detect in samples AOC9-SW02PM05172011 and AOC9-SW03PM05172011 due to this detection. 1,4-Dioxane was not detected in the field samples for the May 2011 sampling event. Acetone and chloromethane were detected in the October 2011 trip blank; acetone was qualified as non-detect in samples AOC9-SW02PM05172011, AOC9-SW03PM05172011, AOC9-MW18PM10242011, AOC9-MW14PM10252011, AOC9-MW06PM10252011, and AOC9-MW17PM10252011. Chloromethane was not detected in the field samples for the October 2011 sampling event.

An equipment rinsate blank was collected during the October 2011 sampling event due to the malfunction of dedicated sampling equipment in wells MW17 and MW15. The utilization of a non-dedicated backup pump was required on both of these wells. The blank sample was collected by pouring deionized water through the pump after collection of MW17 and decontamination of the backup pump, prior to collection of MW15. Acetone, chlorobenzene, n-propylbenzene, and naphthalene were detected in the rinsate blank. Acetone, n-propylbenzene, and naphthalene were qualified as non-detect in AOC9-MW15PM10252011 due to equipment blank contamination.

A few sample results were qualified "J" as estimated because of minor calibration deviations, laboratory control sample recovery and matrix spike recoveries. Some

results that are deemed to be estimated due to QA/QC deficiencies are reported to be above the site clean-up goals, therefore, no significant impact of data usability is deemed to have occurred. Other results that are in the range of site clean-up goals could be impacted by these QA/QC deficiencies, and the results should be deemed as usable with a statistical laboratory error associated with them.

2.5 Site Survey

All existing monitoring wells were surveyed by the subcontractor, LaFave White & McGivern, during previous investigations to obtain horizontal locations and vertical elevations of each monitoring well. The surveys utilized the existing benchmarks located on Griffiss AFB and are in the New York Central NAD 83 State Plane coordinate system. Horizontal measurements and vertical measurements were obtained to accuracy of 0.001 foot and 0.01 foot, respectively. Monitoring well MW19, which was installed on April 7, 2011, was surveyed in the fall 2011 prior to preparation of this report. Survey data is presented in Appendix B.

2.6 Work Plan Deviations

Deviations from the work plan (EEEPC 2010e) are presented below and field adjustment forms are located in Appendix I:

May 2011 Deviations

- Groundwater measurements were only collected from the 16 permanent monitoring wells on site. Measurements were not taken at temporary wells or piezometers as called for in the work plan, as many of them were removed during the remedial excavation. Approval for this change was received from the USACE prior to the start of the performance monitoring; therefore, a field adjustment form was not generated.

- Instead of spreading the soil on the ground around the well and discharging the water to the ground surface as detailed in the work plan, the investigation-derived waste generated during the drilling, installation, and development of monitoring well MW19 (soil and water) was temporarily containerized in a 55-gallon drum on site and later disposed of by Clean Harbors El Dorado LLC, on November 30, 2011. The disposal manifest is provided in Appendix C.

- Monitoring well MW19 was developed using a peristaltic pump with dedicated tubing and a dedicated bailer as described in Section 2.1.1 instead of using a submersible pump as described in the work plan.

October 2011 Deviations

- Calibration solutions were not included with the Horiba 22 water quality monitor. The rental company provided the field team with a calibration certificate (see Appendix I) indicating in-house calibration was completed so that sampling was not delayed. Calibration solutions were sent and equipment was calibrated in the field upon their arrival.

- Failure of the dedicated bladder pumps in MW15 and MW17. A smaller, back-up bladder pump was used as a replacement to purge and sample groundwater. There was a difference in length of the two pumps; therefore, the back-up pump sat above the midpoint of the screened portion of the well.

- MW17 was sampled before MW15, using the same back-up bladder pump. Therefore, the pump was decontaminated with alconox and deionized water prior to being placed in MW15. A rinsate blank was collected by pouring de-ionized water through the pump after decontamination.

Table 2-1 AOC 9 Performance Monitoring, Groundwater and Surface Water Sample Summary, Former Griffiss Air Force Base, Rome, New York

Sample Number	Screen Interval (feet BGS)	Comment	Analyses TCL VOCs-SW8260B
May 2011 Performance Monitoring			
AOC9-MW06PM05172011	4.2-14.2		X
AOC9-MW14PM05172011	14.0-24.0	MS/MSD	X
AOC9-MW15PM05172011	9.0-14.0		X
AOC9-MW17PM05172011	9.0-14.0		X
AOC9-MW17/DPM05172011	9.0-14.0	Duplicate	X
AOC9-MW19PM05182011	9.0-19.0		X
AOC9-SW01PM05172011	-		X
AOC9-SW02PM05172011	-		X
AOC9-SW03PM05172011	-		X
AOC9-TB1-05172011	-	Trip Blank	X
October 2011 Performance Monitoring			
AOC9-MW06PM10252011	4.2-14.2		X
AOC9-MW14PM10252011	14.0-24.0	MS/MSD	X
AOC9-MW15PM10252011	9.0-14.0		X
AOC9-MW17PM10252011	9.0-14.0		X
AOC9-MW17/DPM10252011	9.0-14.0	Duplicate	X
AOC9-MW19PM10242011	9.0-19.0		X
AOC9-SW01PM10242011	-		X
AOC9-SW02PM10242011	-		X
AOC9-SW03PM10242011	-		X
AOC9-TB1-10242011	-	Trip Blank	X
AOC9-RB1-10252011	-	Rinsate Blank	X

Key:

AOC = Area of Concern.
BGS = Below ground surface.
/D = Duplicate.
ft = Feet.
MS/MSD = Matrix spike/matrix spike duplicate.
RB = Rinsate blank.
TB = Trip blank.
TCL = Target compound list.
VOCs = Volatile organic compounds.

Table 2-2 AOC 9 Performance Monitoring Groundwater Elevation Data, Former Griffiss Air Force Base, Rome, New York

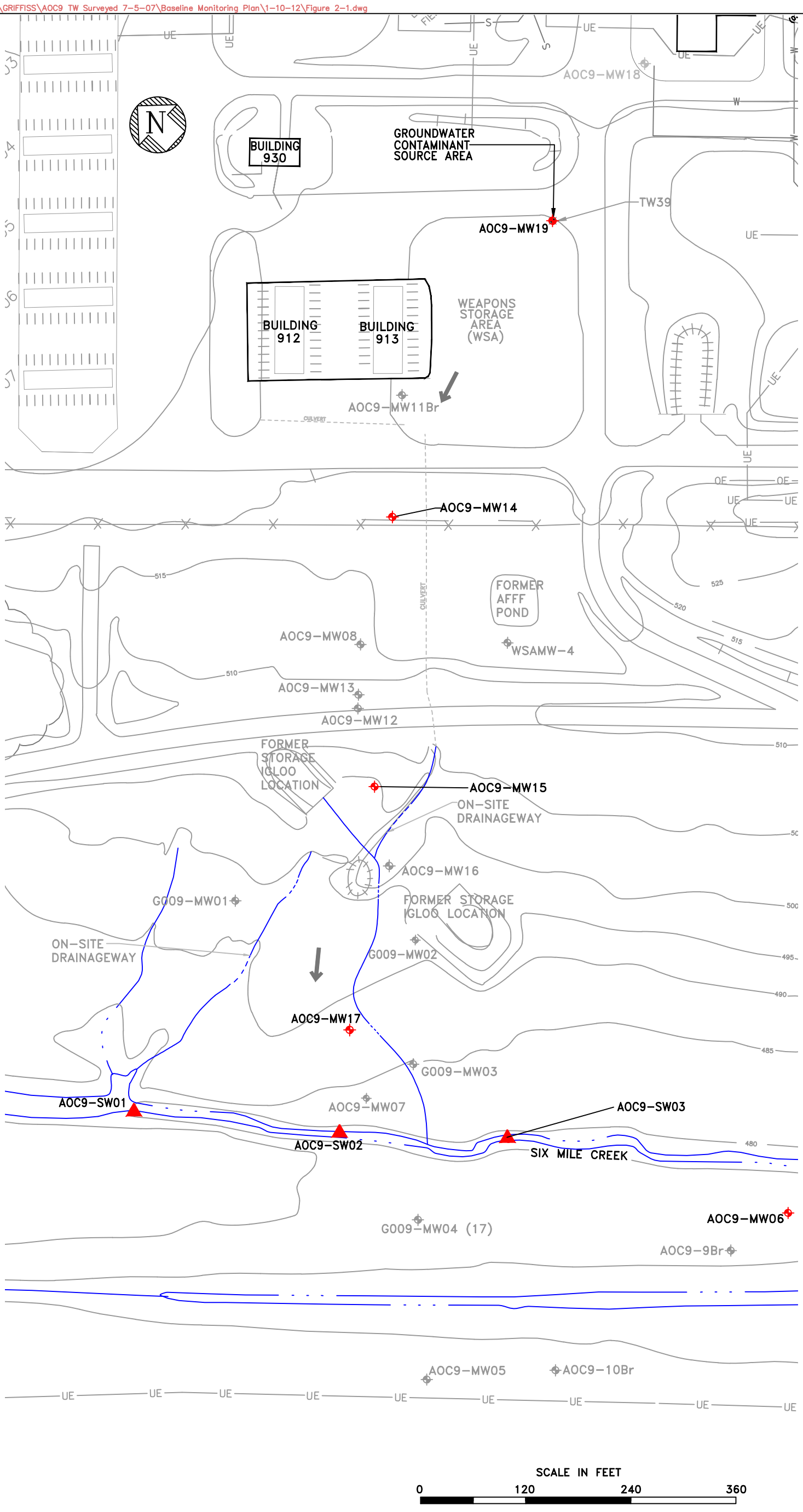
May 2011 Performance Monitoring					
Monitoring Well ID	Date	Ground Surface Elevation (ft AMSL)	Water Level (ft bgs)	Water Level Elevation (ft AMSL)	Comments
G009-MW01	5/17/2011	492.67	-0.56	493.23	Negative value indicates water was above ground surface.
G009-MW02	5/17/2011	494.54	2.63	491.91	
G009-MW03	5/17/2011	485.1	0.31	484.79	
G009-MW04	5/17/2011	483.97	7.45	476.52	
AOC9-MW05	5/17/2011	482.72	4.36	478.36	
AOC9-MW06	5/17/2011	482.57	4.96	477.61	
AOC9-MW07	5/17/2011	483.25	2.62	480.63	
AOC9-MW08	5/17/2011	514.28	7.96	506.32	
AOC9-MW12	5/17/2011	509.09	3.69	505.4	
AOC9-MW13	5/17/2011	508.53	2.9	505.63	
AOC9-MW14	5/17/2011	519.05	11.38	507.67	
AOC9-MW15	5/17/2011	500.04	0.55	499.49	
AOC9-MW16	5/17/2011	497.31	0.84	496.47	
AOC9-MW17	5/17/2011	487.51	1.1	486.41	
AOC9-MW18	5/17/2011	527.84	10.55	517.29	
AOC9-MW19	5/17/2011	523.38	8.21	515.17	

Table 2-2 AOC 9 Performance Monitoring Groundwater Elevation Data, Former Griffiss Air Force Base, Rome, New York

October 2011 Performance Monitoring					
Monitoring Well ID	Date	Ground Surface Elevation (ft AMSL)	Water Level (ft bgs)	Water Level Elevation (ft AMSL)	Comments
G009-MW01	10/24/2011	492.67	-0.28	492.95	Negative value indicates water was above ground surface.
G009-MW02	10/24/2011	494.54	2.25	492.29	
G009-MW03	10/24/2011	485.1	0.28	484.82	
G009-MW04	10/24/2011	483.97	7.46	476.51	
AOC9-MW05	10/24/2011	482.72	4.10	478.62	
AOC9-MW06	10/24/2011	482.57	4.96	477.61	
AOC9-MW07	10/24/2011	483.25	1.88	481.37	
AOC9-MW08	10/24/2011	514.28	8.77	505.51	
AOC9-MW12	10/24/2011	509.09	4.44	504.65	
AOC9-MW13	10/24/2011	508.53	3.66	504.87	
AOC9-MW14	10/24/2011	519.05	12.38	506.67	
AOC9-MW15	10/24/2011	500.04	0.96	499.08	
AOC9-MW16	10/24/2011	497.31	1.34	495.97	
AOC9-MW17	10/24/2011	487.51	1.57	485.94	
AOC9-MW18	10/24/2011	527.84	13.45	514.39	
AOC9-MW19	10/24/2011	523.38	9.58	513.80	

Key:
AMS = Above mean sea level
AOC = Area of Concern
BGS = Below Ground Surface
ft = Feet
MW = Monitoring Well
NA = Not Available
TW = Temporary Monitoring Well

F:\GRIFFISS\AOC9 TW Surveyed 7-5-07\Baseline Monitoring Plan\1-10-12\Figure 2-1.dwg



LEGEND

- 525 — TOPOGRAPHIC CONTOUR LINE (CONTOUR INTERVAL = 5 FT)
- AOC9-MW14 — PERFORMANCE MONITORING WELL SAMPLE LOCATION
- EXISTING WELL
- GROUNDWATER FLOW DIRECTION
- SURFACE WATER SAMPLING LOCATIONS
- TW39 — TEMPORARY MONITORING WELL

NOTES:

1. MONITORING WELL AOC9-MW19 IS A NEW WELL INSTALLED IN THE PLUME SOURCE AREA AFTER THE AOC9 GROUNDWATER REMEDY WAS COMPLETED, AND PRIOR TO PERFORMANCE MONITORING. AOC9-MW19 WAS INSTALLED AT THE LOCATION OF TEMPORARY WELL TW-39, WHICH CONTAINED 21,610 ug/L OF TOTAL VOCs IN GROUNDWATER.

SCALE IN FEET

0 120 240 360

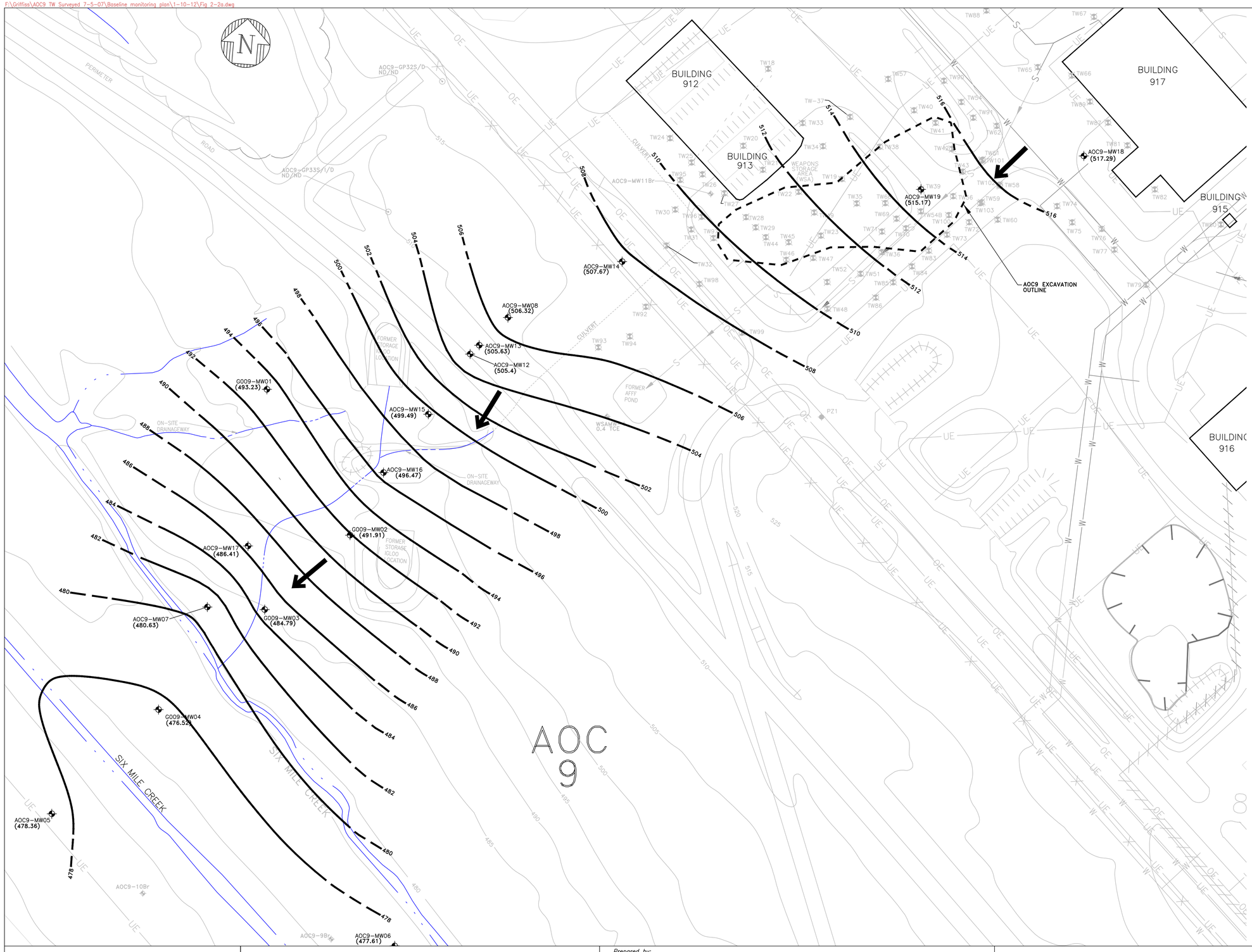
FORMER GRIFFISS AFB
AOC 9 SITE
ROME, NEW YORK

Prepared by:
ecology and environment engineering p.c.
In association with:
parsons

DRAWING TITLE:
AOC 9
PERFORMANCE MONITORING
SAMPLE LOCATION MAP

FIGURE 2-1

F:\Griffiss\AOC9 TW Surveyed 7-5-07\Baseline monitoring plan\1-10-12\Fig 2-2a.dwg



LEGEND

- FENCE
- 525 — TOPOGRAPHIC CONTOUR LINE (CONTOUR INTERVAL = 5 FT)
- UE — UNDERGROUND ELECTRIC
- W — WATER LINE
- S — SANITARY SEWER
- OE — OVERHEAD ELECTRIC
- ABANDONED UNDERGROUND ELECTRIC
- AMSL — ABOVE MEAN SEA LEVEL
- 476 — GROUNDWATER CONTOUR (DASHED WHERE INFERRED)
- DIRECTION OF GROUNDWATER FLOW
- G009-MW01 — PERMANENT MONITORING WELL LOCATION WITH GROUNDWATER ELEVATION
- TW44 — TEMPORARY MONITORING WELL LOCATION
- PZ-1 — PIEZOMETER LOCATION
- (517.35) — MAY 17, 2011 GROUNDWATER ELEVATION (FEET AMSL)

NOTE:
1. GROUNDWATER ELEVATIONS WERE COLLECTED ON 5/17/2011.

60 0 60 120

SCALE: 1"=60'

GRIFFISS AFB
AOC 9 SITE
ROME, NEW YORK

Prepared by: ecology and environment engineering p.c.

In Association with: parsons

DRAWING TITLE:
AOC 9: GROUNDWATER CONTOUR MAP MAY 17, 2011

FIGURE 2-2a

F:\Griffiss\AOC9 TW Surveyed 7-5-07\Baseline monitoring plan\1-10-12\Fig 2-2b.dwg



LEGEND

- FENCE
- 525 — TOPOGRAPHIC CONTOUR LINE (CONTOUR INTERVAL = 5 FT)
- UE — UNDERGROUND ELECTRIC
- W — WATER LINE
- S — SANITARY SEWER
- OE — OVERHEAD ELECTRIC
- ABANDONED UNDERGROUND ELECTRIC
- AMSL — ABOVE MEAN SEA LEVEL
- 476 — GROUNDWATER CONTOUR (DASHED WHERE INFERRED)
- DIRECTION OF GROUNDWATER FLOW
- G009-MW01 — PERMANENT MONITORING WELL LOCATION WITH GROUNDWATER ELEVATION
- TW44 — TEMPORARY MONITORING WELL LOCATION
- PZ-1 — PIEZOMETER LOCATION
- (517.35) — MAY 17, 2011 GROUNDWATER ELEVATION (FEET AMSL)

NOTE:
1. GROUNDWATER ELEVATIONS WERE COLLECTED ON 10/24/2011.

60 0 60 120
SCALE: 1"=60'

GRIFFISS AFB
AOC 9 SITE
ROME, NEW YORK

Prepared by: ecology and environment engineering p.c.

In Association with: parsons

DRAWING TITLE:
AOC 9: GROUNDWATER CONTOUR MAP
OCTOBER 24, 2011

FIGURE 2-2b

3 AOC 9 Performance Monitoring Findings

This section presents the results from the May 2011 and October 2011 performance monitoring conducted at AOC 9 at the former Griffiss AFB in Rome, New York, as described in Section 2.

The AOC 9 May 2011 and October 2011 performance monitoring was intended to evaluate the short-term effectiveness of the remediation efforts on VOC concentrations in the groundwater and Six Mile Creek. The AOC 9 May 2011 and October 2011 performance monitoring groundwater data are screened against the most stringent of either the NYSDEC Class GA groundwater criteria or the EPA MCLs. However, the NYSDEC Class GA criteria for groundwater COCs at AOC 9 are the more stringent of the screening criteria. Surface water data is screened against the NYSDEC Class C freshwater fish propagation standards and guidance values. Data collected during the AOC 9 May 2011 and October 2011 performance monitoring have been provided by the laboratory in Environmental Restoration Program Information Management System (ERPIMS)-compatible format. The performance monitoring data has been added to the Air Force database.

3.1 May 2011 Performance Monitoring

3.1.1 Groundwater Sampling Results

Six groundwater samples were collected from five monitoring wells, including one duplicate sample, and analyzed for VOCs (EPA Method SW8260B) by Katahdin Analytical Services. The purpose of the groundwater sampling was to evaluate VOC concentrations within the contaminant plume following the remedial excavation activities. The water samples were collected between May 17 and 18, 2011.

Groundwater samples were collected from monitoring wells screened predominately in very fine to medium grained sand at depths ranging from 4 to 24 feet bgs and constructed with either a 5-foot or a 10-foot (2-inch diameter, 0.01-inch slot) PVC screen. Each sample was analyzed for VOCs (EPA Method SW8260B) as described in Section 2. A summary of the positive analytical results for the May 2011 performance groundwater samples is presented in Table 3-1a. Historical sampling results are presented in Table 3-3. Figure 2-1 shows the locations of the monitoring wells.

The primary (COCs) for AOC 9 include; chlorobenzene, 1,2-DCB, 1,4-DCB, and TCE, which constitute approximately 90% of the total VOCs detected on-site

within the center line of the plume. Figure 3-1a shows the total VOC contaminants in groundwater based on the analytical data obtained during the May 2011 performance monitoring event and the historical geoprobe data that was used to generate the non-detect contour lines.

Upgradient (Source Area) Wells [MW19]

All four of the primary COCs were detected in the groundwater samples collected at MW19. Additionally, two other VOCs were detected below the screening criteria. Two of the primary contaminants; chlorobenzene (18 µg/L) and 1, 2-DCB (6.0 µg/L) exceeded NYSDEC Class GA groundwater standards.

Center Line of Plume (Downgradient of Source Area) Wells [MW14, MW15, and MW17]

Twenty-five VOCs, including the four primary COCs, chlorobenzene, TCE, and 1, 2-DCB, and 1, 4-DCB were detected in the groundwater samples collected. Eleven of the contaminants exceeded the NYSDEC Class GA groundwater standards. The highest total VOC concentrations were detected during this investigation in monitoring wells MW14 (1,200 µg/L) and MW15 (1,100 µg/L).

Sentinel (Downgradient) Wells [MW06]

Only one primary COC, TCE (1.0 µg/L) was detected in the groundwater samples collected and did not exceed the NYSDEC Class GA groundwater standards.

A summary of the positive analytical results for the May 2011 performance groundwater samples is presented in Table 3-1a. The completed groundwater sampling forms are provided in Appendix E; the complete analytical data are included on CD in Appendix G; a complete list of all samples collected is provided in Table 2-1; and Figure 3-1a shows the locations of the monitoring wells with total VOC contaminant concentrations.

Groundwater Elevation Measurements

Groundwater elevations were collected in accordance with the work plan by measuring the depth to water at 16 locations (see Table 2-2) using a water level indicator to measure the static water levels from the top of the casing at each location. These measurements were used to create a groundwater contour map (see Figure 2-2a).

Based on these data, the groundwater on site flows generally to the southwest from the vicinity of Building 917, through the AOC 9 contaminant source area , and ultimately towards Six Mile Creek. The depth to groundwater and direction of groundwater flow has remained consistent following the excavation and backfill of the contaminant source area, while exhibiting typical seasonal variations.

3.1.2 Surface Water Sampling Results

Three surface water samples were collected from Six Mile Creek (SW01, SW02, SW03) and analyzed for VOCs (EPA Method SW8260B) by Katahdin Analytical Services. The purpose of the surface water samples collected was to establish

May 2011 performance monitoring VOC concentrations within Six Mile Creek following the remedial excavation activities. The surface water samples were collected on May 17, 2011.

Figure 2-1 shows the location of the surface water sampling locations and Figure 3-1a shows the total VOC contaminants in surface water based on analytical data obtained from this monitoring event.

Two different VOCs (1, 2-DCB and chlorobenzene) were detected in at least one surface water sample collected during this investigation, with chlorobenzene detected in all three samples (see Table 3-2a). None of the contaminants were detected at concentrations exceeding the NYSDEC Class C Freshwater Fish Propagation Standards and Guidance Values. The highest total VOC concentrations were detected during this investigation in surface water sample SW03 (2.2 µg/L), which was collected at the location immediately downstream of where the center of the groundwater contaminant plume intersects Six Mile Creek.

The completed surface water sampling forms are provided in Appendix E, the complete analytical data are included on CD in Appendix G; a complete list of all samples collected is provided in Table 2-1, a summary of the positive analytical results for the surface water samples is presented in Table 3-2a, and Figure 3-1a shows the locations of Six Mile Creek surface water sample location with total VOC contaminant concentrations.

3.1.3 MAROS and Trend Analysis

Available historic data collected from monitoring wells MW06, MW014, MW15, MW17, and MW19 and surface water sample locations SW01, SW02, and SW03 are provided in Tables 3-3 and 3-4, respectively. Data collected in 2003 during the groundwater treatability study, during which Fenton's reagent was injected into the groundwater in the vicinity of MW08, have not been included in the historical data summary tables as the analytical results are impacted by the treatability study.

However, available data for each sample location have been plotted on trend graphs and are provided in Figures 3-5 through 3-8. Data from 2006 to the current sampling event is provided for all wells, except MW06 and MW19. MW06 has data beginning in 2002 and MW19 was first sampled with this round of performance monitoring. The trend graphs show total VOC concentration for each sampling event and a discussion of the changes observed is described below.

Upgradient (Source Area) Wells [MW19]

There is no available historic data for MW19 at this time, since it was installed prior to this sampling event. The total VOC concentration in the location of MW19, installed in April 2011, following source area excavation, has decreased from 21,610 µg/L, detected in temporary monitoring well TW39 at the same location during the PDI 2 sampling performed in 2007, to 31 µg/L. At this time there are not the required four sets of data to use the Air Force Center for Engineering

and the Environment (AFCEE) Monitoring and Remediation Optimization System Software (MAROS) Version 2.2 on MW19.

Center Line of Plume (Downgradient of Source Area) Wells [MW14, MW15, and MW17]

MW14 has shown a decrease in concentration in all four primary COCs since baseline sampling, although three COCs (chlorobenzene, 1,2-DCB, and 1,4-DCB) exceeded the screening criteria during this performance monitoring event. Since the baseline sampling round at MW14 in July 2010; chlorobenzene has decreased in concentration from 1,400 to 950 µg/L, 1, 2-DCB has decreased from 130 to 76 µg/L, 1, 4-DCB has decreased from 87 to 53 µg/L, and TCE has decreased from 28 to 2.0 µg/L. The total VOC concentration in MW14 decreased from 2,100 µg/L during the baseline sampling to 1,200 µg/L during this first performance monitoring sampling event. Historically, MW14 has shown a decrease in total VOC concentration with each sampling event (see Figure 3-6).

MW15 has shown a decrease in concentration in two of the primary COCs. Chlorobenzene has decreased in concentration from 1,300 to 990 µg/L, and 1, 4-DCB has decreased from 64 to 58 µg/L since baseline sampling. TCE has remained stable and below the screening criteria values. 1, 2-DCB has shown slight fluctuations (55 to 74 µg/L), which could be attributed to seasonal variations. However, the total VOC concentrations at MW15 decreased from 1,700 µg/L to 1,100 µg/L. The historical trends on Figure 3-7, show an overall decrease in total VOC concentration.

MW17 has shown a decrease in concentration in all four primary COCs, although they exceed the screening criteria. Chlorobenzene has decreased in concentration from 760 to 450 µg/L, 1, 2-DCB has decreased from 50 to 44 µg/L, 1,4-DCB has decreased from 38 to 24 µg/L, and TCE has decreased from 14 to 12 µg/L. Total VOC concentrations at MW17 decreased from 890 µg/L to 560 µg/L. Historically, MW17 has shown a fluctuation in total VOC concentration, but overall a slight increase can be observed on Figure 3-8.

Sentinel (Downgradient) Wells [MW06]

TCE was the only VOC detected at MW06 (1.0 µg/L), which has remained unchanged. Historically, TCE is the only VOC detected at MW06 and Figure 3-5, shows a slight fluctuation in the total VOC concentration.

Surface Water (SW01, SW02, and SW03)

Surface water sample results obtained from sample locations SW01, SW02, and SW03 have also primarily shown a decrease in the concentration of the primary COCs (excluding TCE which was non-detect in all samples) and are consistently below the Class C freshwater fish propagation standards against which they are screened. The upstream location (SW01) previously had total VOC concentrations of non-detect during baseline sampling. This was the only location to show an increase in VOC concentration; chlorobenzene increased from non-detect to 0.6 µg/L since baseline sampling. The location where the center of the groundwa-

ter contaminant plume intersects Six Mile Creek (SW02) indicated a decrease in total VOC concentrations from 5.2 to 2.0 µg/L. Chlorobenzene decrease from 3.0 to 2.0 µg/L and 1,2-DCB was non-detect. Sample location SW03, at the downstream edge of the groundwater plume's intersection with Six Mile Creek previously had total VOC concentrations of 3.6 µg/L, but all primary COCs decreased in concentration during this performance monitoring event. Chlorobenzene decreased from 3.0 to 2.0 µg/L, 1,2-DCB decreased from 0.3 to 0.2 µg/L, and 1,4-DCB was non-detect.

Overall, the May 2011 performance monitoring analytical results indicate that the AOC 9 total VOC concentration is decreasing in comparison to the 2010 baseline sampling results and the groundwater plume has decreased in size to the 2010 baseline sampling for chlorobenzene, TCE, and total DCBs (see Figure 3-2 through 3-4). Based on the analytical results obtained from monitoring well MW06, the leading edge of the plume appears to have remained stable. In addition, the plume area within the source area excavation has decreased in size and VOC concentration. TCE has most notably decreased in size within the source excavation area (see Figure 3-3). Additional historical data are tabulated and trend graphs are provided in Section 3.3. A comparison of May 2011 performance analytical results to the baseline and historical analytical results indicates that the AOC 9 groundwater plume has begun to decrease in size and total VOC concentration. Specifically, the size of the plume has decreased within the vicinity of the source area. Figures 3-2 through 3-4 show the changes in plume size based on the concentrations of the primary COCs.

Statistical trend analyses using the AFCEE's MAROS program were not performed on the available data as several of the monitoring locations do not yet have the required four sets of data to use the MAROS program. It is anticipated that the MAROS program will be used to perform the statistical analysis following the second round of performance monitoring, at which time sufficient data will be available for each sampling location in the performance monitoring program except monitoring well MW19 (first sampled during this May 2011 performance sampling event).

3.1.4 May 2011 Summary

The May 2011 performance sampling conducted at AOC 9 consists of groundwater and surface water sampling and analysis to evaluate the VOC concentrations in the groundwater plume and Six Mile Creek following the remedial excavation activities.

Six groundwater and three surface water samples were collected from the five monitoring wells and Six Mile Creek, including one duplicate sample, and analyzed for VOCs (EPA Method SW8260B) by Katahdin Analytical Services. Figure 2-1 shows the sampling locations and Figure 3-1a shows the total VOC contaminant concentrations in groundwater and surface water based on the analytical data obtained during this monitoring event. Figure 1-2 shows the total VOC con-

taminant concentration in groundwater and surface water obtained during the 2010 baseline sampling.

A comparison of May 2011 performance analytical results to the baseline and historical analytical results indicates that the AOC 9 VOC concentrations have begun to decrease (see Table 3-3). Based on the analytical results obtained from monitoring well MW06, the plume appears to have remained stable along the leading edge. MW19 results indicate the plume has decreased in concentration within the vicinity of the source area, and the results obtained from MW14, MW15, and MW17 indicate that total VOC concentrations within the plume have begun to decrease significantly.

Surface water sample results obtained from sample locations SW01, SW02, and SW03 have also been relatively consistent over previous sampling events, but have generally shown a slight decrease in VOC concentration during this performance sampling. The upstream location (SW01) previously had total VOC concentrations ranging from non-detect to 1.78 µg/L, and during this performance monitoring event, 0.6 µg/L of total VOCs was detected. The location where the center of the groundwater contaminant plume intersects Six Mile Creek (SW02) previously had total VOC concentrations ranging from non-detect to 5.2 µg/L, and during this performance monitoring event 2.0 µg/L of total VOCs was detected. Sample location SW03, at the downstream edge of the groundwater plume's intersection with Six Mile Creek previously had total VOC concentrations ranging from non-detect to 3.6 µg/L, and during this performance monitoring event 2.2 µg/L of total VOCs was detected.

The next performance monitoring event took place in October 2011 (included in this report) to continue evaluation of the effectiveness of the remediation efforts and provide additional data for evaluating potential locations for sodium persulfate injections.

3.2 October 2011 Performance Monitoring

3.2.1 Groundwater Sampling Results

Six groundwater samples were collected from five monitoring wells, including one duplicate sample, and analyzed for VOCs (EPA Method SW8260B) by Katahdin Analytical Services. The purpose of the water sampling was to evaluate VOC concentrations within the contaminant plume following the remedial excavation activities. The water samples were collected between October 24 and 25, 2011.

Groundwater samples were collected from monitoring wells screened predominately in very fine to medium grained sand at depths ranging from 4 to 24 feet bgs and constructed with either a 5-foot or a 10-foot (2-inch diameter, 0.01-inch slot) PVC screen. Each sample was analyzed for VOCs (EPA Method SW8260B) as described in Section 2. A summary of the positive analytical results for the October 2011 performance groundwater samples is presented in Table 3-1b. Historical

sampling results are presented in Table 3-3. Figure 2-1 shows the locations of the monitoring wells.

The primary COCs for AOC 9 include; chlorobenzene, 1, 21, 2-DCB, 1, 4-DCB, and TCE, which constitute approximately 95% of the total VOCs detected on-site within the center line of the plume. Figure 3-1b illustrates the total VOC contaminants in groundwater based on the analytical data obtained during the October 2011 performance monitoring event and the historical geoprobe data that was used to generate the non-detect contour lines.

Upgradient (Source Area) Wells [MW19]

All four of the primary COCs were detected in the groundwater sample collected at MW19. Additionally, three other VOCs were detected with cis-1,2-dichloroethylene (15 µg/L) exceeding the screening criteria. Three of the primary contaminants; chlorobenzene (14 µg/L), 1, 2-DCB (6.0 µg/L), and 1,4-DCB (4.0 µg/L) exceeded NYSDEC Class GA groundwater standards.

Center Line of Plume (Downgradient of Source Area) Wells [MW14, MW15, and MW17]

Twenty-one VOCs, including the four primary COCs, chlorobenzene, TCE, and 1, 2-DCB, and 1, 4-DCB were detected in the groundwater samples collected. Six of the contaminants exceeded the NYSDEC Class GA groundwater standards. Chlorobenzene, 1,2-DCB, and 1,4-DCB exceeding the screening criteria in all three monitoring wells. TCE only exceeded the screening criteria in MW17. The highest total VOC concentrations were detected during this sampling event in monitoring wells MW15 (460 µg/L) and MW17 (680 µg/L).

Sentinel (Downgradient) Wells [MW06]

Two primary COCs, chlorobenzene (0.9 µg/L) and TCE (1.0 µg/L) were detected in the groundwater samples collected and did not exceed the NYSDEC Class GA groundwater standards. Two additional VOCs were also detected in MW06, but did not exceed the screening criteria.

A summary of the positive analytical results for the October 2011 performance groundwater samples is presented in Table 3-1b. The completed groundwater sampling forms are provided in Appendix E; the complete analytical data are included on CD in Appendix G; a complete list of all samples collected is provided in Table 2-1; and Figure 3-1b shows the locations of the monitoring wells with total VOC contaminant concentrations.

Groundwater Elevation Measurements

Groundwater elevations were collected in accordance with the work plan by measuring the depth to water at 16 locations (see Table 2-2) using a water level indicator to measure the static water levels from the top of the casing at each location. These measurements were used to create a groundwater contour map (see Figure 2-2b).

Based on these data, the groundwater on-site flows generally to the southwest from the vicinity of Building 917, through the AOC 9 contaminant source area , and ultimately towards Six Mile Creek. The depth to groundwater and direction of groundwater flow has remained consistent following the excavation and back-fill of the contaminant source area, while exhibiting typical seasonal variations.

3.2.2 Surface Water Sampling Results

Three surface water samples were collected from Six Mile Creek (SW01, SW02, SW03) and analyzed for VOCs (EPA Method SW8260B) by Katahdin Analytical Services. The purpose of the surface water samples collected was to establish October 2011 performance monitoring VOC concentrations within Six Mile Creek following the remedial excavation activities. The surface water samples were collected on October 24, 2011.

Figure 2-1 shows the location of the surface water sampling locations and Figure 3-1b shows the total VOC contaminants in surface water based on analytical data obtained from this monitoring event.

Six different VOCs, including the primary COCs (1, 2-DCB, 1, 4-DCB, chlorobenzene, and TCE) and cis-1,2-dichloroethylene and tetrachloroethylene were detected in at least one surface water sample collected during this investigation (see Table 3-2b). Chlorobenzene (9.0 µg/L) was detected at concentrations exceeding the NYSDEC Class C Freshwater Fish Propagation Standards and Guidance Values in surface water SW02. The highest total VOC concentrations were detected during this investigation in surface water sample SW02 (9.7 µg/L), which was collected at the location immediately upstream of where the center of the groundwater contaminant plume intersects Six Mile Creek.

The completed surface water sampling forms are provided in Appendix E, the complete analytical data are included on compact disk in Appendix G; a complete list of all samples collected is provided in Table 2-1, a summary of the positive analytical results for the surface water samples is presented in Table 3-2b, and Figure 3-1b shows the locations of Six Mile Creek surface water sample location with total VOC contaminant concentrations.

3.2.3 MAROS and Trend Analysis

Available historic data collected from monitoring wells MW06, MW014, MW15, MW17, and MW19 and surface water sample locations SW01, SW02, and SW03 are provided in Tables 3-3 and 3-4, respectively. Data collected in 2003 during the groundwater treatability study, during which Fenton's reagent was injected into the groundwater in the vicinity of monitoring well MW08, have not been included in the historical data summary tables as the analytical results are impacted by the treatability study.

However, available data for each sample location have been plotted on trend graphs and are provided in Figures 3-5 through 3-9. Data from 2006 to the current sampling event is provided for all wells, except MW06 and MW19. MW06

has data beginning in 2002 and MW19 was first sampled during the May 2011 performance monitoring event. The trend graphs show total VOC concentration for each sampling event and a discussion of the changes observed is described below.

Upgradient (Source Area) Wells [MW19]

The total VOC concentration in the location of MW19 has increased from 31 µg/l, detected during the May 2011 performance monitoring, to 42 µg/L. While this slight increase could be attributed to seasonal variation, it should be noted that the overall total VOC concentration has decreased from 21,610 µg/L, detected in temporary monitoring well TW39 at the same location during the PDI 2 sampling performed in 2007. The primary COCs overall have remained relatively stable with slight fluctuations; chlorobenzene decreased from 18 µg/L to 14 µg/L and 1,4-DCB had a slight increase from 3.0 µg/L to 4.0 µg/L.

Center Line of Plume (Downgradient of Source Area) Wells (MW14, MW15, and MW17)

MW14 continues to show a decrease in concentration in all four primary COCs since baseline sampling, although three (chlorobenzene, 1,2-DCB, and 1,4-DCB) exceeded the screening criteria during this performance monitoring event. Since the first performance sampling round at MW14 in May 2011; chlorobenzene has decreased in concentration from 950 to 350 µg/L, 1, 2-DCB has decreased from 76 to 40 µg/L, 1, 4-DCB has decreased from 53 to 34 µg/L, and TCE has remained stable at 2.0 µg/L. The total VOC concentration in MW14 decreased from 1,200 µg/L during the first performance sampling to 450 µg/L during this second performance monitoring sampling event. In addition, no VOCs showed an increase in concentration during this sampling event. Historically, overall total VOC concentration has decreased (see Figure 3-6).

MW15 has shown a decrease in concentration in all of the primary COCs since the performance sampling round in May 2011. Chlorobenzene has decreased in concentration from 990 to 390 µg/L, 1,2-DCB has decreased from 74 µg/L to 26 µg/L, 1, 4-DCB has decreased from 58 to 28 µg/L, and TCE decreased from 2.0 µg/L to 0.4 µg/L. The total VOC concentrations at MW15 continued to decrease from 1,100 µg/L to 460 µg/L. Historically, total VOC concentration trends in MW15 show a decrease (see Figure 3-7).

MW17 has shown an increase in concentration in all of the primary COCs, with all four exceeding the screening criteria. Chlorobenzene has increased in concentration from 450 to 540 µg/L, 1,4-DCB has increased from 24 to 26 µg/L 1,2-DCB has increased from 44 µg/L to 69 µg/L, and TCE has increased from 12 to 14 µg/L since the first performance sampling in May 2011. At the same time, total VOC concentrations at MW17 increased from 560 µg/L to 680 µg/L. Nine VOCs showed an increase in concentration. Historically, total VOC concentrations in MW17 have fluctuated, but an overall increase can be observed on Figure 3-8.

Sentinel (Downgradient) Well (MW06)

Historically, TCE is the only VOC detected at MW06 (1.0 µg/L). However, MW06 showed an increase in one primary COC, chlorobenzene increased from non-detect during the first performance sampling to 0.9 µg/L during this second performance monitoring sampling. There was also an increase in two other VOCs, but all detections in MW06 remained below the screening criteria. Total VOC concentrations increased from 1.0 µg/L during the first performance monitoring to 6.9 µg/L during this second performance monitoring event. Historically, TCE is the only VOC detected at MW06 and concentrations have remained relatively stable until this round of performance monitoring (see Figure 3-5).

Surface Water (SW01, SW02, and SW03)

Surface water sample results obtained from sample locations SW01, SW02, and SW03 have also primarily shown an increase in the VOC concentration and are consistently below the Class C freshwater fish propagation standards against which they are screened, with the exception of chlorobenzene (9.0 µg/L) during this second performance monitoring event. The upstream location (SW01) previously had total VOC concentrations of 0.6 µg/L during the first performance monitoring sampling, which increased to 2.1 µg/L during this second performance monitoring event. While SW01 showed a decrease in chlorobenzene (non-detect), TCE and two other VOCs increased. The location where the center of the groundwater contaminant plume intersects Six Mile Creek (SW02) had the largest increase in total VOC concentrations from 2.0 to 9.7 µg/L. Chlorobenzene increased from 2.0 to 9.0 µg/L and total DCBs increased from non-detect to 0.7 µg/L. The increases in contaminant concentration within SW01 and SW02 may be attributed to seasonal variations or disturbances of the contaminant plume resulting from remediation activities. Sample location SW03, at the downstream edge of the groundwater plume's intersection with Six Mile Creek remained the same in all concentrations from the first performance monitoring event.

Overall, the October 2011 performance monitoring analytical results indicate that the AOC 9 total VOC concentration is decreasing in comparison to the 2010 baseline sampling and May 2011 performance results and the groundwater plume has continued to decrease in size to those same events for chlorobenzene and total DCBs (see Figures 3-2 and 3-4). The TCE plume has decreased since 2010 baseline sampling, but has remained relatively stable since the May 2011 performance monitoring event. Based on the analytical results obtained from monitoring well MW06, the leading edge of the plume appears to have remained stable. In addition, the chlorobenzene and TCE plume areas within the source area excavation has decreased in size and VOC concentration. However, the total DCB plume within the source area excavation has shown a decrease in VOC concentration, but only a small decrease in plume size. The increases in contaminant concentration within MW06, MW17, and MW19 may be attributed to seasonal variations or disturbances of the contaminant plume resulting from remediation activities. Additional historical data are tabulated and trend graphs are provided in Section 3.3. A comparison of October 2011 performance analytical results to the baseline, May 2011 performance, and historical analytical results indicates that the AOC 9

groundwater plume has generally continued to show a decrease in total VOC concentration. Specifically, the size of the plume has decreased within the vicinity of the source area. Figures 3-2 through 3-4 show the changes in plume size based on the concentrations of the primary COCs.

The historical and performance sampling results collected at AOC 9 were analyzed for statistical trend analyses using the AFCEE's MAROS Version 2.2 program to assess trends in contaminant concentrations along the observed plume and evaluate the effectiveness of the remedy implemented at the site (see Appendix J). Currently, performance monitoring at the site consists of sampling for VOCs at five wells along the tail of the plume. These wells include: MW06, MW14, MW15, MW17, and MW19. Additional well data was added to the program for MW01 and MW02 as necessitated by the program to fully perform plume computations; MAROS requires input of data for a minimum of six well locations with at least four sampling events to perform several of the analyses. These two additional well data sets will also provide historical reference of the plume concentrations and further delineate the plume in MAROS; no future sampling has been proposed at these locations. Figures 3-5 through 3-9 are trend graphs wells MW06, MW14, MW15, and MW17. MAROS was not performed on MW19 (first sampled during this May 2011 performance sampling event) as there was not a sufficient amount of data. However, available data for MW19 has been plotted on a trend graph and is provided in Figure 3-9.

Model input required by MAROS included analytical results for each sampling event as observed at individual well locations, coordinates of each well, estimates of current plume geometry (e.g., length and width), aquifer characteristics (e.g., seepage velocity, porosity, and thickness) and the type of treatment implemented at the source location.

Several trend analyses were performed in the model for the select COCs: 1,2-DCB, 1,4-DCB, chlorobenzene, and TCE. Output results from the MAROS evaluations are attached (see Appendix J), showing the Mann-Kendall Statistics, Linear Regression, Statistical Trend, Spatial Moment Analysis and Plume Analysis Summaries.

The statistical analysis performed using the Mann-Kendall model indicates that concentrations of chlorobenzene and 1, 4-DCB are decreasing within the wells (MW14 and MW15) downgradient of the former source area. 1, 2-DCB also shows a decreasing trend in MW14 (see Appendix J). The model indicates that TCE and 1, 2-DCB remain stable in MW15 and MW17. Although total VOCs increased in monitoring well MW06 during the October 2011 performance monitoring event, the Mann-Kendall model does not statistically show any trend changes due to the limited data available. Overall, the Mann-Kendall model does indicate a downward trend within the contaminant plume immediately downgradient of the groundwater remediation area, and does not indicate any increasing trend in concentration of any COC. Additional monitoring of the site is nec-

essary to fully examine the effectiveness of the AOC 9 remedial action and to evaluate potential migration of contaminants.

3.2.4 October 2011 Summary and Recommendations

The October 2011 performance sampling conducted at AOC 9 consists of groundwater and surface water sampling and analysis to evaluate the VOC concentrations in the groundwater plume and Six Mile Creek following the remedial excavation activities.

Six groundwater and three surface water samples were collected from the five monitoring wells and Six Mile Creek, including one duplicate sample, and analyzed for VOCs (EPA Method SW8260B) by Katahdin Analytical Services. Figure 2-1 shows the sampling locations and Figure 3-1b shows the total VOC contaminant concentrations in groundwater and surface water based on the analytical data obtained during this monitoring event. Figure 1-2 shows the total VOC contaminant concentration in groundwater and surface water obtained during the 2010 baseline sampling.

A comparison of October 2011 performance analytical results to the baseline and historical analytical results indicates that the AOC 9 VOC concentrations have generally continued to decrease (see Table 3-3). Based on the analytical results obtained from monitoring well MW06, the plume appears to have remained stable along the leading edge. MW19 results indicate the plume has decreased in concentration within the vicinity of the source area for chlorobenzene, while TCE and total DCBs has remained relatively stable. The results obtained from MW14, MW15, indicate that total VOC concentrations within the plume have begun to decrease, although MW17 has shown an increase in VOC concentrations.

Surface water sample results obtained from sample locations SW01, SW02, and SW03 have also shown a slight increase in VOC concentration during this performance sampling. The location where the center of the groundwater contaminant plume intersects Six Mile Creek (SW02) previously had total VOC concentrations of 2.0 µg/L during the first performance monitoring event and during this performance monitoring event, 9.7 µg/L of total VOCs was detected. SW01, the upstream location, also showed an increase in total VOC concentration (0.6 µg/L to 2.1 µg/L) and SW03, the downstream edge where the plume intersects the Creek, remained stable.

The contaminant concentration increases seen in groundwater in the downgradient wells (MW06 and MW17) and surface water samples (SW01 and SW02) may be attributed to seasonal variations or disturbances of the contaminant plume resulting from remediation activities.

The next performance monitoring event will take place in the spring of 2012 to continue evaluation of the effectiveness of the remediation efforts and provide additional data for evaluating potential locations for sodium persulfate injections. A total of two performance sampling events remain to be conducted over the next

year at six-month intervals. No changes to the approved monitoring plan are proposed at this time.

3.2.5 Effectiveness of Remedy

Since baseline sampling, the center line of plume monitoring wells (MW14, MW15, and MW17) have seen a reduction in total VOC contamination. A reduction of 79%, 73%, and 24%, respectively is shown from baseline to the October 2011 performance monitoring event. MW06 has shown an increase in total VOC contamination from 1.0 µg/L to 6.9 µg/L since baseline sampling. MW19 was not installed until after baseline sampling and has also shown an increase in total VOC contamination, from 31 µg/L to 42 µg/L since the May 2011 performance monitoring event.

Based on the reductions within the center line of plume wells, a significant reduction in the plume can be seen. Removal of the source area has allowed the aquifer to flush the contaminant mobilized by excavation, which could attribute to the increase in MW06. It also appears this disturbance has caused a slight increase in MW19 during the October 2011 performance monitoring event. It is expected that a continued decrease in contamination levels from upgradient to downgradient wells will be seen over upcoming sampling events. However, continued fluctuations may be observed in the downgradient portion of the plume, until the aquifer has flushed more contamination through. It is recommended that monitoring of the site continues.

At this time, additional actions are not warranted for observed increasing trends in groundwater or surface water. Section 1.4 describes potential additional actions when three consecutive concentration increases are identified. Currently, this is not applicable as there are not three consecutive increases in VOC contamination in any groundwater or surface water sample. Continued monitoring will occur at the site.

Table 3-1a AOC 9 May 2011 Performance Monitoring, Summary of Positive Results for Groundwater Samples, Former Griffiss Air Force Base, Rome, NY

Analyte	Sample ID: Date: Screening Criteria [1]	AOC9-MW06PM05172011 05/17/11	AOC9-MW14PM05172011 05/17/11	AOC9-MW15PM05172011 05/17/11	AOC9-MW17PM05172011 05/17/11	AOC9-MW19PM05182011 05/18/11	AOC9-MW17/DPM05172011 05/17/11
VOCs by Method SW8260B							
1,2,4-TRIMETHYLBENZENE	5	1.0 U	**15**	**0.9 J**	1.0 U	1.0 U	1.0 U
1,2-DICHLOROBENZENE	3	1.0 U	**76**	**74**	**44**	**6.0**	**43**
1,3-DICHLOROBENZENE	3	1.0 U	**4.0**	**5.0**	**2.0**	1.0 U	**2.0**
1,4-DICHLOROBENZENE	3	1.0 U	**53**	**58**	**24**	**3.0**	**23**
ACETONE	50	5.0 U	5.0 U	5.0 U	**2.0 J**	5.0 U	5.0 U
BENZENE	1	1.0 U	**1.0**	**1.0**	**5.0**	1.0 U	**5.0**
CHLOROBENZENE	5	1.0 UJ	**950 J**	**990 J**	**450 J**	**18 J**	**440 J**
CIS-1,2-DICHLOROETHYLENE	5	1.0 U	**2.0**	**2.0**	**5.0**	**3.0**	**5.0**
CYCLOHEXANE	NA	1.0 U	**12**	**2.0**	**3.0**	1.0 U	**3.0**
CYMENE	5	1.0 U	**0.3 J**	1.0 U	1.0 U	1.0 U	1.0 U
ETHYLBENZENE	5	1.0 U	**7.0**	**3.0**	**0.4 J**	1.0 U	**0.4 J**
ISOPROPYLBENZENE	5	1.0 U	**11**	**7.0**	**2.0 J**	1.0 U	**1.0 J**
M,P-XYLENE	NA	2.0 U	**11**	**0.7 J**	2.0 U	2.0 U	2.0 U
METHYLCYCLOHEXANE	NA	1.0 U	**17**	**6.0**	**1.0**	1.0 U	**0.9 J**
NAPHTHALENE	10	1.0 U	**4.0**	**0.4 J**	1.0 U	1.0 U	1.0 U
N-BUTYLBENZENE	5	1.0 U	**2.0**	**2.0**	1.0 U	1.0 U	1.0 U
N-PROPYLBENZENE	5	1.0 U	**8.0**	**5.0**	1.0 U	1.0 U	1.0 U
O-XYLENE	5	1.0 U	**0.3 J**	1.0 U	1.0 U	1.0 U	1.0 U
SEC-BUTYLBENZENE	5	1.0 U	**4.0**	**6.0**	**0.8 J**	1.0 U	**0.7 J**
T-BUTYLBENZENE	5	1.0 U	**2.0**	**1.0**	**0.5 J**	1.0 U	**0.4 J**
TETRACHLOROETHYLENE	5	1.0 U	1.0 U	1.0 U	**0.9 J**	1.0 U	**1.0**
TOLUENE	5	1.0 U	1.0 U	**0.3 J**	1.0 U	1.0 U	1.0 U
TRANS-1,2-DICHLOROETHENE	5	1.0 U	1.0 U	1.0 U	**1.0**	1.0 U	**1.0**
TRICHLOROETHYLENE	5	**1.0**	**2.0**	**2.0**	**12**	**0.5 J**	**12**
VINYL CHLORIDE	2	2.0 U	**1.0 J**	**0.5 J**	**4.0**	**0.6 J**	**4.0**
TOTAL VOCs	NA	**1.0**	**1200**	**1100**	**560**	**31**	**540**

Notes:
1. Shaded cells exceed the screening value.
2. Bold values denote positive hits.

Key:

= Guidance value . U = Not detected . µg/L = Micrograms per liter. -- = Analyte not analyzed for. /Q Designates field duplicate sample.
J = Estimated value. UJ = Not detected/Estimated Value. mg/L = Milligrams per liter. VOCs = Volatile organic compounds.

Note: 1 New York State Department of Environmental Conservation, Technical and Operational Guidance Series Memorandum #1.1.1: Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, 1998 , Class GA Groundwater Standards and Guidance Values.

Table 3-1b AOC 9 October 2011 Performance Monitoring, Summary of Positive Results for Groundwater Samples, Former Griffiss Air Force Base, Rome, NY

Analyte	Sample ID: / Date: / Screening Criteria [1]	AOC9-MW06PM10252011 10/25/11	AOC9-MW14PM10252011 10/25/11	AOC9-MW15PM10252011 10/25/11	AOC9-MW17PM10252011 10/25/11	AOC9-MW19PM10242011 10/24/11	AOC9-MW17/DPM10252011 10/25/11
VOCs by Method SW8260B							
1,2,4-TRIMETHYLBENZENE	5	1.0 U	**1.0**	1.0 U	1.0 U	1.0 U	1.0 U
1,2-DICHLOROBENZENE	3	1.0 U	**40**	**26**	**69**	**6.0**	**69**
1,3-DICHLOROBENZENE	3	1.0 U	**2.0**	**2.0**	**2.0**	1.0 U	**2.0**
1,4-DICHLOROBENZENE	3	1.0 U	**34**	**28**	**26**	**4.0**	**28**
1,2-DICHLOROETHANE	5	1.0 U	1.0 U	1.0 U	**0.4 J**	1.0 U	**0.4 J**
ACETONE	50	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
BENZENE	1	1.0 U	**1.0**	**2.0**	**6.0 J**	**0.4 J**	**3.0 J**
CHLOROBENZENE	5	**0.9 J**	**350**	**390**	**540**	**14**	**530**
CIS-1,2-DICHLOROETHYLENE	5	1.0 U	**2.0**	**0.4 J**	**4.0**	**15**	**4.0**
CYCLOHEXANE	NA	1.0 U	**1.0**	**0.6 J**	**0.7 J**	1.0 U	**0.4 J**
ETHYLBENZENE	5	1.0 U	**1.0**	**0.7 J**	**1.0 J**	1.0 U	**0.3 J**
ISOPROPYLBENZENE	5	1.0 U	**3.0**	**2.0**	**2.0 J**	1.0 U	**1.0 J**
M,P-XYLENE	NA	2.0 U	**0.7 J**	2.0 U	2.0 U	2.0 U	2.0 U
METHYLCYCLOHEXANE	NA	1.0 U	**2.0**	**0.6 J**	1.0 U	1.0 U	1.0 U
N-BUTYLBENZENE	5	1.0 U	**2.0 J**	**0.5 J**	1.0 U	1.0 U	1.0 U
N-PROPYLBENZENE	5	**2.0**	**3.0**	1.0 U	**2.0**	1.0 U	**2.0**
NAPHTHALENE	10	**3.0**	1.0 U	1.0 U	**3.0**	1.0 U	1.0 U
SEC-BUTYLBENZENE	5	1.0 U	**3.0**	**2.0**	**0.6 J**	1.0 U	**0.7 J**
T-BUTYLBENZENE	5	1.0 U	**1.0**	**1.0**	1.0 U	1.0 U	**0.3 J**
TETRACHLOROETHYLENE	5	1.0 U	1.0 U	1.0 U	**2.0**	1.0 U	**2.0**
TRANS-1,2-DICHLOROETHENE	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**0.6 J**
TRICHLOROETHYLENE	5	**1.0**	**2.0**	**0.4 J**	**14**	**0.5 J**	**16**
VINYL CHLORIDE	2	2.0 U	**1.0 J**	**0.7 J**	**3.0**	**2.0**	**4.0**
TOTAL VOCs	NA	**6.9 J**	**450 J**	**460 J**	**680 J**	**42 J**	**660 J**

Notes:
1. Shaded cells exceed the screening value.
2. Bold values denote positive hits.

Key:

= Guidance value .
J = Estimated value.
U = Not detected .
UJ = Not detected/Estimated Value.
µg/L = Micrograms per liter.
mg/L = Milligrams per liter.
-- = Analyte not analyzed for.
VOCs = Volatile organic compounds.
/Q Designates field duplicate sample.

Note: 1 New York State Department of Environmental Conservation, Technical and Operational Guidance Series Memorandum #1.1.1: Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, 1998 , Class GA Groundwater Standards and Guidance Values.

Table 3-2a AOC 9 May 2011 Performance Monitoring, Summary of Positive Results for Surface Water Samples, Former Griffiss Air Force Base Rome, NY

Analyte	Sample ID: Date: Screening Criteria (1)	AOC9-SW01PM05172011 05/17/11	AOC9-SW02PM05172011 05/17/11	AOC9-SW03PM05172011 05/17/11
VOCs by Method SW8260B (µg/L)				
1,2-DICHLOROBENZENE	3	1.0 U	1.0 U	**0.2 J**
CHLOROBENZENE	5	**0.6 J**	**2.0 J**	**2.0 J**
TOTAL VOCs	**NA**	**0.6 J**	**2.0 J**	**2.2 J**

Notes
1. Shaded cells exceed the screening value.
2. Bold values denote positive hits.

Key:
(g) = Guidance value (no applicable standard).
J = Estimated value.
U = Not detected (lab reporting limit shown).
UJ = Not detected/Estimated Value.
µg/L = Micrograms per liter.
mg/L = Milligrams per liter.
-- = Analyte not analyzed for.
VOCs = Volatile organic compounds.
/Q = Designates field duplicate sample

Note:
1 New York State Department of Environmental Conservation, Class C Freshwater Fish Propagation Standards and Guidance Values.

Table 3-2b AOC 9 October 2011 Performance Monitoring, Summary of Positive Results for Surface Water Samples, Former Griffiss Air Force Base Rome, NY

Analyte	Sample ID: Date: Screening Criteria (1)	AOC9-SW01PM10242011 10/24/11	AOC9-SW02PM10242011 10/24/11	AOC9-SW03PM10242011 10/24/11
VOCs by Method SW8260B (µg/L)				
1,2-DICHLOROBENZENE	NA	1.0 U	**0.3 J**	**0.2 J**
1,4-DICHLOROBENZENE	NA	1.0 U	**0.4 J**	1.0 U
cis-1,2-DICHLOROETHENE	NA	**0.4 J**	1.0 U	1.0 U
CHLOROBENZENE	5	1.0 U	**9.0**	**2.0**
TETRACHLOROETHENE	NA	**1.0 J**	1.0 U	1.0 U
TRICHLOROETHENE	NA	**0.7 J**	1.0 U	1.0 U
TOTAL VOCs	**NA**	**2.1 J**	**9.7 J**	**2.2 J**

Notes:
1. Shaded cells exceed the screening value.
2. Bold values denote positive hits.

Key:
(g) = Guidance value (no applicable standard).
J = Estimated value.
U = Not detected (lab reporting limit shown).
UJ = Not detected/Estimated Value.
µg/L = Micrograms per liter.
mg/L = Milligrams per liter.
-- = Analyte not analyzed for.
VOCs = Volatile organic compounds.
/Q = Designates field duplicate sample

Note:
1 New York State Department of Environmental Conservation, Class C Freshwater Fish Propagation Standards and Guidance Values.

Table 3-3 AOC 9 Historic Groundwater Sample Results

Well Number	Screening Criteria [1]	Parameter	Analytical Results by Sample Date(s) (µg/L)						
			12/18/97 to 12/19/97	5/8/00 to 5/25/00	9/7/04 to 9/9/04	10/23/06 to 11/13/06	7/27/10 to 7/29/10	5/17/11 to 5/18/11	10/24/11 to 10/25/11
			Ref 1	Ref 2	Ref 3	Ref 4	E & E 2010 AOC 9 Baseline Sampling	E & E 2011 AOC 9 Performance Sampling Event 1	E & E 2011 AOC 9 Performance Sampling Event 2
G009-MW01	5	1,1-Dichloroethene	U	U	U	-	U	-	-
	3	1,2-Dichlorobenzene	U	**0.363**	**0.597**	-	**0.8 J**	-	-
	0.6	1,2-Dichloroethane	U	U	U	-	U	-	-
	5	1,2,4-Trimethylbenzene	NA	U	U	-	U	-	-
	5	1,3,5-Trimethylbenzene	NA	U	U	-	U	-	-
	3	1,3-Dichlorobenzene	NA	U	U	-	U	-	-
	3	1,4-Dichlorobenzene	U	U	U	-	U	-	-
	5	4-Chlorotoluene	NA	U	U	-	NA	-	-
	1	Benzene	U	U	U	-	U	-	-
	5	Chlorobenzene	U	U	U	-	U	-	-
	5	cis-1,2-Dichloroethylene	U	U	**0.123**	-	U	-	-
	NA	Cyclohexane	NA	NA	NA	-	U	-	-
	5	Ethylbenzene	U	U	U	-	U	-	-
	5	Isopropylbenzene (Cumene)	NA	U	U	-	U	-	-
	NA	Methylcyclohexane	NA	NA	NA	-	U	-	-
	5	Methylene Chloride	U	U	U	-	U	-	-
	NA	m-p-Xylene	NA	U	U	-	U	-	-
	10	Naphthalene	NA	U	U	-	U	-	-
	5	n-Butylbenzene	NA	U	U	-	U	-	-
	5	n-Propylbenzene	NA	U	U	-	U	-	-
	5	o-Xylene (1,2-Dimethylbenzene)	NA	U	U	-	U	-	-
	5	p-Isopropyltoluene	NA	NA	NA	-	U	-	-
	5	sec-Butylbenzene	NA	U	U	-	U	-	-
	5	Styrene	U	U	U	-	U	-	-
	5	t-Butylbenzene	NA	U	U	-	U	-	-
	5	Tetrachloroethylene (PCE)	U	U	U	-	U	-	-
	5	Toluene	U	U	U	-	U	-	-
	5	Trans-1,2-Dichloroethene	NA	U	U	-	U	-	-
	5	Trichloroethylene (TCE)	U	**0.869**	**0.882**	-	**0.6 J**	-	-
	2	Vinyl Chloride	U	U	U	-	U	-	-
	NA	Total VOCs	0	**1.232**	**1.602**	-	**1.4**	-	-

Key and References at the end of Table.

Table 3-3 AOC 9 Historic Groundwater Sample Results

Well Number	Screening Criteria [1]	Parameter	Analytical Results by Sample Date(s) (µg/L)						
			12/18/97 to 12/19/97	5/8/00 to 5/25/00	9/7/04 to 9/9/04	10/23/06 to 11/13/06	7/27/10 to 7/29/10	5/17/11 to 5/18/11	10/24/11 to 10/25/11
			Ref 1	Ref 2	Ref 3	Ref 4	E & E 2010 AOC 9 Baseline Sampling	E & E 2011 AOC 9 Performance Sampling Event 1	E & E 2011 AOC 9 Performance Sampling Event 2
G009-MW02	5	1,1-Dichloroethene	U	U	U	U	U	-	-
	3	1,2-Dichlorobenzene	U	U	U	U	U	-	-
	0.6	1,2-Dichloroethane	U	U	U	U	U	-	-
	5	1,2,4-Trimethylbenzene	NA	U	U	U	U	-	-
	5	1,3,5-Trimethylbenzene	NA	U	U	U	U	-	-
	3	1,3-Dichlorobenzene	NA	U	U	U	U	-	-
	3	1,4-Dichlorobenzene	U	U	U	U	U	-	-
	5	4-Chlorotoluene	NA	U	U	U	NA	-	-
	1	Benzene	U	U	U	U	U	-	-
	5	Chlorobenzene	U	U	U	U	U	-	-
	5	cis-1,2-Dichloroethylene	U	U	U	U	U	-	-
	NA	Cyclohexane	NA	NA	NA	NA	U	-	-
	5	Ethylbenzene	U	U	U	U	U	-	-
	5	Isopropylbenzene (Cumene)	NA	U	U	U	U	-	-
	NA	Methylcyclohexane	NA	NA	NA	NA	U	-	-
	5	Methylene Chloride	U	U	U	U	U	-	-
	NA	m-p-Xylene	NA	U	U	U	U	-	-
	10	Naphthalene	NA	U	U	U	U	-	-
	5	n-Butylbenzene	NA	U	U	U	U	-	-
	5	n-Propylbenzene	NA	U	U	U	U	-	-
	5	o-Xylene (1,2-Dimethylbenzene)	NA	U	U	U	U	-	-
	5	p-Isopropyltoluene	NA	NA	NA	U	U	-	-
	5	sec-Butylbenzene	NA	U	U	U	U	-	-
	5	Styrene	U	U	U	U	U	-	-
	5	t-Butylbenzene	NA	U	U	U	U	-	-
	5	Tetrachloroethylene (PCE)	U	U	U	U	U	-	-
	5	Toluene	U	U	U	U	U	-	-
	5	Trans-1,2-Dichloroethene	NA	U	U	U	U	-	-
	5	Trichloroethylene (TCE)	U	**0.888**	**1.78**	**0.61 J**	**0.7 J**	-	-
	2	Vinyl Chloride	U	U	U	U	U	-	-
	NA	Total VOCs	0	**0.888**	**1.78**	**0.61**	**0.7**	-	-

Key and References at the end of Table.

Table 3-3 AOC 9 Historic Groundwater Sample Results

Well Number	Screening Criteria [1]	Parameter	Analytical Results by Sample Date(s) (µg/L)						
			12/18/97 to 12/19/97	5/8/00 to 5/25/00	9/7/04 to 9/9/04	10/23/06 to 11/13/06	7/27/10 to 7/29/10	5/17/11 to 5/18/11	10/24/11 to 10/25/11
			Ref 1	Ref 2	Ref 3	Ref 4	E & E 2010 AOC 9 Baseline Sampling	E & E 2011 AOC 9 Performance Sampling Event 1	E & E 2011 AOC 9 Performance Sampling Event 2
AOC9-MW05	5	1,1-Dichloroethene	-	U	U	U	U	-	-
	3	1,2-Dichlorobenzene	-	U	U	U	U	-	-
	0.6	1,2-Dichloroethane	-	U	U	U	U	-	-
	5	1,2,4-Trimethylbenzene	-	U	U	U	U	-	-
	5	1,3,5-Trimethylbenzene	-	U	U	U	U	-	-
	3	1,3-Dichlorobenzene	-	U	U	U	U	-	-
	3	1,4-Dichlorobenzene	-	U	U	U	U	-	-
	5	4-Chlorotoluene	-	U	U	U	NA	-	-
	1	Benzene	-	U	U	U	U	-	-
	5	Chlorobenzene	-	U	U	U	U	-	-
	5	cis-1,2-Dichloroethylene	-	U	U	U	U	-	-
	NA	Cyclohexane	-	NA	NA	NA	U	-	-
	5	Ethylbenzene	-	U	U	U	U	-	-
	5	Isopropylbenzene (Cumene)	-	U	U	U	U	-	-
	NA	Methylcyclohexane	-	NA	NA	NA	U	-	-
	5	Methylene Chloride	-	U	U	U	U	-	-
	NA	m-p-Xylene	-	U	U	U	U	-	-
	10	Naphthalene	-	U	U	U	U	-	-
	5	n-Butylbenzene	-	U	U	U	U	-	-
	5	n-Propylbenzene	-	U	U	U	U	-	-
	5	o-Xylene (1,2-Dimethylbenzene)	-	U	U	U	U	-	-
	5	p-Isopropyltoluene	-	NA	NA	U	U	-	-
	5	sec-Butylbenzene	-	U	U	U	U	-	-
	5	Styrene	-	U	U	U	U	-	-
	5	t-Butylbenzene	-	U	U	U	U	-	-
	5	Tetrachloroethylene (PCE)	-	U	U	U	U	-	-
	5	Toluene	-	U	U	U	U	-	-
	5	Trans-1,2-Dichloroethene	-	U	U	U	U	-	-
	5	Trichloroethylene (TCE)	-	U	U	U	U	-	-
	2	Vinyl Chloride	-	U	U	U	U	-	-
	NA	Total VOCs	-	0	0	0	0	-	-

Key and References at the end of Table.

Table 3-3 AOC 9 Historic Groundwater Sample Results

Well Number	Screening Criteria [1]	Parameter	Analytical Results by Sample Date(s) (µg/L)						
			12/18/97 to 12/19/97	5/8/00 to 5/25/00	9/7/04 to 9/9/04	10/23/06 to 11/13/06	7/27/10 to 7/29/10	5/17/11 to 5/18/11	10/24/11 to 10/25/11
			Ref 1	Ref 2	Ref 3	Ref 4	E & E 2010 AOC 9 Baseline Sampling	E & E 2011 AOC 9 Performance Sampling Event 1	E & E 2011 AOC 9 Performance Sampling Event 2
AOC9-MW06	5	1,1-Dichloroethene	-	U	U	-	U	U	U
	3	1,2-Dichlorobenzene	-	U	U	-	U	U	U
	0.6	1,2-Dichloroethane	-	U	U	-	U	U	U
	5	1,2,4-Trimethylbenzene		U	U	-	U	U	U
	5	1,3,5-Trimethylbenzene	-	U	U	-	U	U	U
	3	1,3-Dichlorobenzene	-	U	U	-	U	U	U
	3	1,4-Dichlorobenzene	-	U	U	-	U	U	U
	5	4-Chlorotoluene	-	U	U	-	NA	U	U
	1	Benzene	-	U	U	-	U	U	U
	5	Chlorobenzene	-	U	U	-	U	1.0 UJ	**0.9 J**
	5	cis-1,2-Dichloroethylene	-	U	U	-	U	U	U
	NA	Cyclohexane	-	NA	NA	-	U	U	U
	5	Ethylbenzene	-	U	U	-	U	U	U
	5	Isopropylbenzene (Cumene)	-	U	U	-	U	U	U
	NA	Methylcyclohexane	-	NA	NA	-	U	U	U
	5	Methylene Chloride	-	U	U	-	U	U	U
	NA	m-p-Xylene	-	U	U	-	U	U	U
	10	Naphthalene	-	U	U	-	U	U	**3.0**
	5	n-Butylbenzene	-	U	U	-	U	U	U
	5	n-Propylbenzene	-	U	U	-	U	U	**2.0**
	5	o-Xylene (1,2-Dimethylbenzene)	-	U	U	-	U	U	U
	5	p-Isopropyltoluene	-	NA	NA	-	U	U	U
	5	sec-Butylbenzene	-	U	U	-	U	U	U
	5	Styrene	-	U	U	-	U	U	U
	5	t-Butylbenzene	-	U	U	-	U	U	U
	5	Tetrachloroethylene (PCE)	-	U	U	-	U	U	U
	5	Toluene	-	U	U	-	U	U	U
	5	Trans-1,2-Dichloroethene	-	U	U	-	U	U	U
	5	Trichloroethylene (TCE)	-	**0.854**	**1.77**	-	**1.0**	**1.0**	**1.0**
	2	Vinyl Chloride	-	U	U	-	U	U	U
	NA	Total VOCs	-	**0.854**	**1.77**	-	**1.0**	**1.0**	**6.9**

Key and References at the end of Table.

Table 3-3 AOC 9 Historic Groundwater Sample Results

Well Number	Screening Criteria [1]	Parameter	Analytical Results by Sample Date(s) (µg/L)						
			12/18/97 to 12/19/97	5/8/00 to 5/25/00	9/7/04 to 9/9/04	10/23/06 to 11/13/06	7/27/10 to 7/29/10	5/17/11 to 5/18/11	10/24/11 to 10/25/11
			Ref 1	Ref 2	Ref 3	Ref 4	E & E 2010 AOC 9 Baseline Sampling	E & E 2011 AOC 9 Performance Sampling Event 1	E & E 2011 AOC 9 Performance Sampling Event 2
AOC9-MW14	5	1,1-Dichloroethene	-	-	-	U	**0.7 J**	U	U
	3	1,2-Dichlorobenzene	-	-	-	**170**	**130**	**76**	**40**
	0.6	1,2-Dichloroethane	-	-	-	U	U	U	U
	5	1,2,4-Trimethylbenzene	-	-	-	**220**	**180**	**15**	**1.0**
	5	1,3,5-Trimethylbenzene	-	-	-	**79**	**64**	U	U
	3	1,3-Dichlorobenzene	-	-	-	**7.6**	**6**	**4**	**2**
	3	1,4-Dichlorobenzene	-	-	-	**110**	**87**	**53**	**34**
	5	4-Chlorotoluene	-	-	-	**0.33 J**	NA	U	U
	1	Benzene	-	-	-	**3.5**	**19**	**1.0**	**1.0**
	5	Chlorobenzene	-	-	-	**1700**	**1400**	**950 J**	**350**
	5	cis-1,2-Dichloroethylene	-	-	-	**2.7**	**23**	**2.0**	**2.0**
	NA	Cyclohexane	-	-	-	NA	**22**	**12**	**1.0**
	5	Ethylbenzene	-	-	-	**21**	**10**	**7.0**	**1.0**
	5	Isopropylbenzene (Cumene)	-	-	-	**17**	**14**	**11**	**3.0**
	NA	Methylcyclohexane	-	-	-	NA	**46 J**	**17**	**2.0**
	5	Methylene Chloride	-	-	-	U	NA	U	U
	NA	m-p-Xylene	-	-	-	**68**	**50**	**11**	**0.7 J**
	10	Naphthalene	-	-	-	**51**	**27**	**4.0**	U
	5	n-Butylbenzene	-	-	-	**4.3**	**4.0**	**2.0**	**2.0 J**
	5	n-Propylbenzene	-	-	-	**15**	**14**	**8**	**3.0**
	5	o-Xylene (1,2-Dimethylbenzene)	-	-	-	**5.9**	**5.0**	**0.3 J**	U
	5	p-Isopropyltoluene	-	-	-	**5.5**	**5.0**	U	U
	5	sec-Butylbenzene	-	-	-	**8.3**	**7.0**	**4.0**	**3.0**
	5	Styrene	-	-	-	U	U	U	U
	5	t-Butylbenzene	-	-	-	**3.2**	**2.0**	**2.0**	**1.0**
	5	Tetrachloroethylene (PCE)	-	-	-	U	UJ	U	U
	5	Toluene	-	-	-	**0.75 J**	**3.0**	U	U
	5	Trans-1,2-Dichloroethene	-	-	-	U	**2.0**	U	U
	5	Trichloroethylene (TCE)	-	-	-	**4.8**	**28**	**2.0**	**2.0**
	2	Vinyl Chloride	-	-	-	**1.6**	**17**	**1.0 J**	**1.0 J**
	NA	Total VOCs	-	-	-	**2499**	**2100**	**1200**	**450**

Key and References at the end of Table.

Table 3-3 AOC 9 Historic Groundwater Sample Results

Well Number	Screening Criteria [1]	Parameter	Analytical Results by Sample Date(s) (µg/L)						
			12/18/97 to 12/19/97	5/8/00 to 5/25/00	9/7/04 to 9/9/04	10/23/06 to 11/13/06	7/27/10 to 7/29/10	5/17/11 to 5/18/11	10/24/11 to 10/25/11
			Ref 1	Ref 2	Ref 3	Ref 4	E & E 2010 AOC 9 Baseline Sampling	E & E 2011 AOC 9 Performance Sampling Event 1	E & E 2011 AOC 9 Performance Sampling Event 2
AOC9-MW15	5	1,1-Dichloroethene	-	-	-	U	**0.4 J**	U	U
	3	1,2-Dichlorobenzene	-	-	-	**60 J**	**55**	**74**	**26**
	0.6	1,2-Dichloroethane	-	-	-	U	U	U	U
	5	1,2,4-Trimethylbenzene	-	-	-	**8.0 J**	**35**	**0.9 J**	U
	5	1,3,5-Trimethylbenzene	-	-	-	**10 J**	**18**	U	U
	3	1,3-Dichlorobenzene	-	-	-	**8.0 J**	**6**	**5**	**2.0**
	3	1,4-Dichlorobenzene	-	-	-	**110**	**64**	**58**	**28**
	5	4-Chlorotoluene	-	-	-	U	NA	U	U
	1	Benzene	-	-	-	**12 J**	**26**	**1**	**2**
	5	Chlorobenzene	-	-	-	**1900**	**1300**	**990 J**	**390**
	5	cis-1,2-Dichloroethylene	-	-	-	U	**10**	**2.0**	**0.4 J**
	NA	Cyclohexane	-	-	-	NA	**50**	**2.0**	**0.6 J**
	5	Ethylbenzene	-	-	-	U	**12**	**3.0**	**0.7 J**
	5	Isopropylbenzene (Cumene)	-	-	-	**12 J**	**22**	**7.0**	**2.0**
	NA	Methylcyclohexane	-	-	-	NA	**40 J**	**6.0**	**0.6 J**
	5	Methylene Chloride	-	-	-	**87**	U	U	U
	NA	m-p-Xylene	-	-	-	U	**11**	**0.7 J**	U
	10	Naphthalene	-	-	-	U	U	**0.4 J**	U
	5	n-Butylbenzene	-	-	-	U	**3.0**	**2.0**	**0.5 J**
	5	n-Propylbenzene	-	-	-	U	**8.0**	**5.0**	U
	5	o-Xylene (1,2-Dimethylbenzene)	-	-	-	U	**2.0**	U	U
	5	p-isopropyltoluene	-	-	-	U	**0.7 J**	U	U
	5	sec-Butylbenzene	-	-	-	U	**7.0**	**6.0**	**2.0**
	5	Styrene	-	-	-	U	**2.0**	U	U
	5	t-Butylbenzene	-	-	-	U	**3.0**	**1.0**	**1.0**
	5	Tetrachloroethylene (PCE)	-	-	-	U	UJ	U	U
	5	Toluene	-	-	-	U	**2.0**	**0.3 J**	U
	5	Trans-1,2-Dichloroethene	-	-	-	U	**0.3 J**	U	U
	5	Trichloroethylene (TCE)	-	-	-	U	**2.0**	**2.0**	**0.4 J**
	2	Vinyl Chloride	-	-	-	U	**14**	**0.5 J**	**0.7 J**
	NA	Total VOCs	-	-	-	**2207**	**1700**	**1100**	**457**

Key and References at the end of Table.

Table 3-3 AOC 9 Historic Groundwater Sample Results

Well Number	Screening Criteria [1]	Parameter	Analytical Results by Sample Date(s) (µg/L)						
			12/18/97 to 12/19/97	5/8/00 to 5/25/00	9/7/04 to 9/9/04	10/23/06 to 11/13/06	7/27/10 to 7/29/10	5/17/11 to 5/18/11	10/24/11 to 10/25/11
			Ref 1	Ref 2	Ref 3	Ref 4	E & E 2010 AOC 9 Baseline Sampling	E & E 2011 AOC 9 Performance Sampling Event 1	E & E 2011 AOC 9 Performance Sampling Event 2
AOC9-MW17	5	1,1-Dichloroethene	-	-	-	U	U	U	U
	3	1,2-Dichlorobenzene	-	-	-	**66**	**50**	**44**	**69**
	0.6	1,2-Dichloroethane	-	-	-	**0.68**	**0.4 J**	U	**0.4 J**
	5	1,2,4-Trimethylbenzene	-	-	-	U	U	U	U
	5	1,3,5-Trimethylbenzene	-	-	-	U	U	U	U
	3	1,3-Dichlorobenzene	-	-	-	**1.5**	**3.0**	**2.0**	**2.0**
	3	1,4-Dichlorobenzene	-	-	-	**17**	**38**	**24**	**26**
	5	4-Chlorotoluene	-	-	-	U	NA	U	U
	1	Benzene	-	-	-	**2.6**	**4.0**	**5.0**	**6.0 J**
	5	Chlorobenzene	-	-	-	**250**	**760**	**450 J**	**540**
	5	cis-1,2-Dichloroethylene	-	-	-	**12**	**5.0**	**5.0**	**4.0**
	NA	Cyclohexane	-	-	-	NA	**2.0**	**3.0**	**0.7 J**
	5	Ethylbenzene	-	-	-	U	**0.8 J**	**0.4 J**	**1.0 J**
	5	Isopropylbenzene (Cumene)	-	-	-	**0.25 J**	**2.0**	**2.0 J**	**2.0 J**
	NA	Methylcyclohexane	-	-	-	NA	**0.6 J**	**1.0**	U
	5	Methylene Chloride	-	-	-	U	U	U	U
	NA	m-p-Xylene	-	-	-	U	U	U	U
	10	Naphthalene	-	-	-	U	U	U	**3.0**
	5	n-Butylbenzene	-	-	-	U	U	U	U
	5	n-Propylbenzene	-	-	-	U	U	U	**2.0**
	5	o-Xylene (1,2-Dimethylbenzene)	-	-	-	U	U	U	U
	5	p-Isopropyltoluene	-	-	-	U	U	U	U
	5	sec-Butylbenzene	-	-	-	**0.33 J**	**1.0 J**	**0.8 J**	**0.6 J**
	5	Styrene	-	-	-	U	U	U	U
	5	t-Butylbenzene	-	-	-	**0.26 J**	**0.6 J**	**0.5 J**	U
	5	Tetrachloroethylene (PCE)	-	-	-	**3.0**	**2.0 J**	**0.9 J**	**2.0**
	5	Toluene	-	-	-	**0.39 J**	U	U	U
	5	Trans-1,2-Dichloroethene	-	-	-	U	**0.9 J**	**1.0**	U
	5	Trichloroethylene (TCE)	-	-	-	**19**	**14**	**12**	**14**
	2	Vinyl Chloride	-	-	-	**0.92 J**	**4.0**	**4.0**	**3.0**
	NA	Total VOCs	-	-	-	**374**	**890**	**560**	**676**

Key and References at the end of Table.

Table 3-3 AOC 9 Historic Groundwater Sample Results

Well Number	Screening Criteria [1]	Parameter	Analytical Results by Sample Date(s) (µg/L)						
			12/18/97 to 12/19/97	5/8/00 to 5/25/00	9/7/04 to 9/9/04	10/23/06 to 11/13/06	7/27/10 to 7/29/10	5/17/11 to 5/18/11	10/24/11 to 10/25/11
			Ref 1	Ref 2	Ref 3	Ref 4	E & E 2010 AOC 9 Baseline Sampling	E & E 2011 AOC 9 Performance Sampling Event 1	E & E 2011 AOC 9 Performance Sampling Event 2
AOC9-MW18	5	1,1-Dichloroethene	-	-	-	-	U	-	-
	3	1,2-Dichlorobenzene	-	-	-	-	**0.2 J**	-	-
	0.6	1,2-Dichloroethane	-	-	-	-	U	-	-
	5	1,2,4-Trimethylbenzene	-	-	-	-	U	-	-
	5	1,3,5-Trimethylbenzene	-	-	-	-	U	-	-
	3	1,3-Dichlorobenzene	-	-	-	-	U	-	-
	3	1,4-Dichlorobenzene	-	-	-	-	U	-	-
	5	4-Chlorotoluene	-	-	-	-	NA	-	-
	1	Benzene	-	-	-	-	U	-	-
	5	Chlorobenzene	-	-	-	-	**3.0**	-	-
	5	cis-1,2-Dichloroethylene	-	-	-	-	U	-	-
	NA	Cyclohexane	-	-	-	-	U	-	-
	5	Ethylbenzene	-	-	-	-	U	-	-
	5	Isopropylbenzene (Cumene)	-	-	-	-	U	-	-
	NA	Methylcyclohexane	-	-	-	-	UJ	-	-
	5	Methylene Chloride	-	-	-	-	U	-	-
	NA	m-p-Xylene	-	-	-	-	U	-	-
	10	Naphthalene	-	-	-	-	U	-	-
	5	n-Butylbenzene	-	-	-	-	U	-	-
	5	n-Propylbenzene	-	-	-	-	U	-	-
	5	o-Xylene (1,2-Dimethylbenzene)	-	-	-	-	U	-	-
	5	p-Isopropyltoluene	-	-	-	-	U	-	-
	5	sec-Butylbenzene	-	-	-	-	U	-	-
	5	Styrene	-	-	-	-	U	-	-
	5	t-Butylbenzene	-	-	-	-	U	-	-
	5	Tetrachloroethylene (PCE)	-	-	-	-	UJ	-	-
	5	Toluene	-	-	-	-	U	-	-
	5	Trans-1,2-Dichloroethene	-	-	-	-	U	-	-
	5	Trichloroethylene (TCE)	-	-	-	-	U	-	-
	2	Vinyl Chloride	-	-	-	-	U	-	-
	NA	Total VOCs	-	-	-	-	**3.2**	-	-

Key and References at the end of Table.

Table 3-3 AOC 9 Historic Groundwater Sample Results

Well Number	Screening Criteria [1]	Parameter	Analytical Results by Sample Date(s) (µg/L)						
			12/18/97 to 12/19/97	5/8/00 to 5/25/00	9/7/04 to 9/9/04	10/23/06 to 11/13/06	7/27/10 to 7/29/10	5/17/11 to 5/18/11	10/24/11 to 10/25/11
			Ref 1	Ref 2	Ref 3	Ref 4	E & E 2010 AOC 9 Baseline Sampling	E & E 2011 AOC 9 Performance Sampling Event 1	E & E 2011 AOC 9 Performance Sampling Event 2
AOC9-MW19 [2]	5	1,1-Dichloroethene	-	-	-	-	-	U	U
	3	1,2-Dichlorobenzene	-	-	-	**4930**	-	**6.0**	**6.0**
	0.6	1,2-Dichloroethane	-	-	-	-	-	U	U
	5	1,2,4-Trimethylbenzene	-	-	-	**170**	-	U	U
	5	1,3,5-Trimethylbenzene	-	-	-	**90**	-	U	U
	3	1,3-Dichlorobenzene	-	-	-	**100**	-	U	U
	3	1,4-Dichlorobenzene	-	-	-	**1380**	-	**3.0**	**4.0**
	5	4-Chlorotoluene	-	-	-	U	-	U	U
	1	Benzene	-	-	-	**90**	-	U	**0.4 J**
	5	Chlorobenzene	-	-	-	**14400**	-	**18 J**	**14.0**
	5	cis-1,2-Dichloroethylene	-	-	-	U	-	**3.0**	**15.0**
	NA	Cyclohexane	-	-	-	-	-	U	U
	5	Ethylbenzene	-	-	-	U	-	U	U
	5	Isopropylbenzene (Cumene)	-	-	-	U	-	U	U
	NA	Methylcyclohexane	-	-	-	-	-	U	U
	5	Methylene Chloride	-	-	-	U	-	U	U
	NA	m-p-Xylene	-	-	-	**85**	-	U	U
	10	Naphthalene	-	-	-	**230**	-	U	U
	5	n-Butylbenzene	-	-	-	U	-	U	U
	5	n-Propylbenzene	-	-	-	U	-	U	U
	5	o-Xylene (1,2-Dimethylbenzene)	-	-	-	**75**	-	U	U
	5	p-Isopropyltoluene	-	-	-	U	-	U	U
	5	sec-Butylbenzene	-	-	-	U	-	U	U
	5	Styrene	-	-	-	-	-	U	U
	5	t-Butylbenzene	-	-	-	U	-	U	U
	5	Tetrachloroethylene (PCE)	-	-	-	U	-	U	U
	5	Toluene	-	-	-	**60**	-	U	U
	5	Trans-1,2-Dichloroethene	-	-	-	U	-	U	U
	5	Trichloroethylene (TCE)	-	-	-	U	-	**0.5 J**	**0.5 J**
	2	Vinyl Chloride	-	-	-	U	-	**0.6 J**	**2.0**
	NA	Total VOCs	-	-	-	**21610**	-	**31**	**42**

Key and References at the end of Table.

Table 3-3 AOC 9 Historic Groundwater Sample Results

Well Number	Screening Criteria [1]	Parameter	Analytical Results by Sample Date(s) (µg/L)						
			12/18/97 to 12/19/97	5/8/00 to 5/25/00	9/7/04 to 9/9/04	10/23/06 to 11/13/06	7/27/10 to 7/29/10	5/17/11 to 5/18/11	10/24/11 to 10/25/11
			Ref 1	Ref 2	Ref 3	Ref 4	E & E 2010 AOC 9 Baseline Sampling	E & E 2011 AOC 9 Performance Sampling Event 1	E & E 2011 AOC 9 Performance Sampling Event 2

Key:
J = Estimated concentration.
U = Analyte not detected.
mg/L = Micrograms per liter.
- = Well was not Sampled
NA = Not Analyzed

0.411 J	Bolded values denote positive hits (detections).
14.9	Shaded values denote hits exceeding the NYSDEC standard.

Note:
[1] New York State Department of Environmental Conservation, Class GA Groundwater Standards and Guidance Values.
[2] Data presented under Reference 4 for MW19 is the most recent sampling data for TW39, which was in the same location as MW19. These results are presented for comparison.

References:
(1) E & E. July 1998. Draft Report for Expanded Site Investigation and Confirmatory Sampling of Areas of Interest and Drywell/Wastewater-Related Systems
(2) E & E. August 2001. AOC 9: Weapons Storage Area (WSA) Landfill Supplemental Investigation Final data Summary Report.
(3) FPM Group. February 2005. Groundwater Monitoring Report.
(4) FPM Group. August 2007. Baseline and PDI2 Sampling Final Monitoring Report.

Key and References at the end of Table.

Table 3-4 AOC 9 Hisotric Surface Water Sample Results

Surface Water Sample Number	Screening Criteria[1]	Parameter	Analytical Results by Sample Date(s) (µg/L)					
			11/4/97	5/10/00	11/13/06	7/27/10	5/17/11	10/24/11
			Ref 1	Ref 2	Ref 3	E & E 2010 AOC 9 Baseline Sampling	E & E 2011 AOC 9 Performance Sampling Event 1	E & E 2011 AOC 9 Performance Sampling Event 2
SW01[2]	5	Chlorobenzene	U	**0.85 J**	U	U	**0.6J**	U
	NA	1,2-DCB	NA	U	U	U	U	U
	NA	1,4-DCB	NA	U	U	U	U	U
	5	Total DCB	NA	U	U	U	U	U
	NA	Acetone	U	NA	**1.78 J**	U	U	U
	NA	cis-1,2-Dichloroethene	U	U	**U**	U	U	**0.4 J**
	NA	Tetrachloroethene	U	U	**U**	U	U	**1.0 J**
	NA	Trichloroethene	U	U	**U**	U	U	**0.7 J**
	NA	Total VOCs	0	**0.85**	**1.78**	0	**0.6J**	**2.1 J**
SW02[3]	5	Chlorobenzene	U	**0.835**	**3.99**	**3.0**	**2.0J**	**9.0**
	NA	1,2-DCB	NA	**0.406 J**	**0.290 J**	**0.2 J**	U	**0.3 J**
	NA	1,4-DCB	NA	U	**0.260 J**	U	U	**0.4 J**
	5	Total DCB	NA	**0.406 J**	**0.550 J**	**0.2 J**	U	**0.7 J**
	NA	Acetone	U	NA	**1.8 J**	**2 J**	U	U
	NA	Total VOCs	0	**1.241**	**4.5**	**5.2**	**2.0J**	**9.7 J**
SW03[4]	5	Chlorobenzene	U	**0.236 J**	**1.22**	**3.0**	**2.0J**	**2.0**
	NA	1,2-DCB	NA	U	**0.120 J**	**0.3 J**	**0.2J**	**0.2 J**
	NA	1,4-DCB	NA	U	U	**0.3 J**	U	U
	5	Total DCB	NA	U	**0.120 J**	**0.6 J**	**0.2 J**	**0.2 J**
	NA	Acetone	U	NA	**1.86 J**	U	U	U
	NA	Total VOCs	0	**0.236**	**1.34**	**3.6**	**2.2J**	**2.2 J**

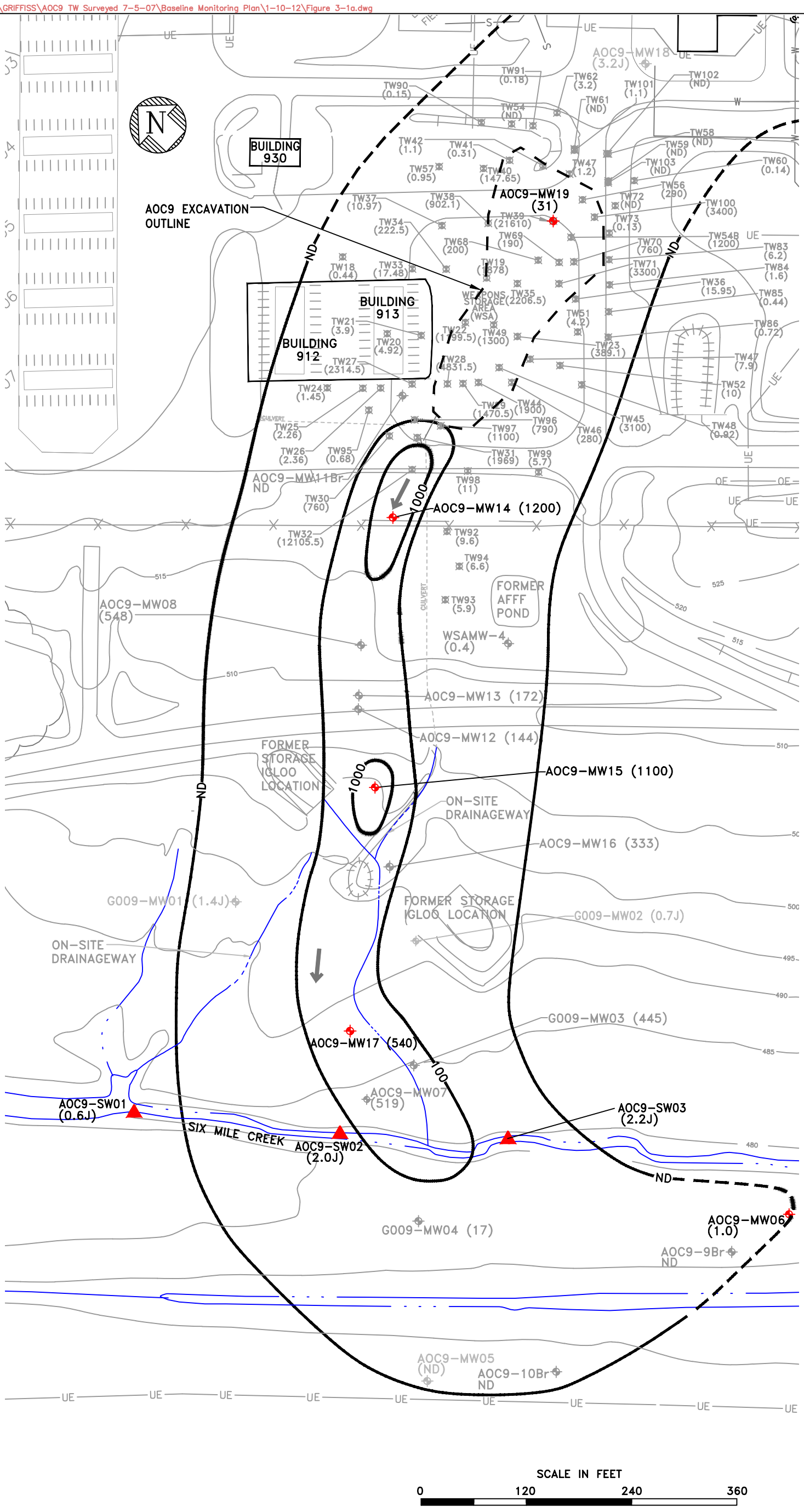
Key:
J = Estimated concentration.
U = Analyte not detected.
mg/L = Micrograms per liter.
NA = Not Analyzed

0.411 J	Bolded values denote positive hits (detections).
14.9	Shaded values denote hits exceeding the NYSDEC standard.

Note:
[1] New York State Department of Environmental Conservation, Class C Freshwater Fish Propagation Standards and Guidance Values.
[2] SW01 is labeled as SW05 in Reference 1; SW01 is labeled as SW09 in Reference 2
[3] SW02 is labeled as SW07 in Reference 1; SW02 is labeled as SW10 in Reference 2
[4] SW03 is labeled as SW06 in Reference 1; SW03 is labeled as SW11 in Reference 2

References:
(1) E & E. July 1998. Draft Report for Expanded Site Investigation and Confirmatory Sampling of Areas of Interest and Drywell/Wastewater-Related Systems
(2) E & E. August 2001. AOC 9: Weapons Storage Area (WSA) Landfill Supplemental Investigation Final data Summary Repor
(3) FPM Group. August 2007. Baseline and PDI2 Sampling Final Monitoring Report

F:\GRIFFISS\AOC9 TW Surveyed 7-5-07\Baseline Monitoring Plan\1-10-12\Figure 3-1a.dwg



LEGEND

525	TOPOGRAPHIC CONTOUR LINE (CONTOUR INTERVAL = 5 FT)
ND	NOT DETECTED
10000	TOTAL VOC CONTOUR IN ug/L (DASHED WHERE INFERRED)
AOC9-MW14	PERFORMANCE MONITORING WELL SAMPLE LOCATION
AOC9-MW08 (548)	EXISTING WELL WITH HISTORIC TOTAL VOC CONCENTRATION IN GROUNDWATER (ug/L), SEE NOTES BELOW
(31)	MAY 2011 PERFORMANCE SAMPLING TOTAL VOC CONCENTRATION IN GROUNDWATER AND SURFACE WATER (ug/L)
→	GROUNDWATER FLOW DIRECTION
▲	SURFACE WATER SAMPLING LOCATIONS
TW99 (5.7)	2006 AND 2007 PREDESIGN TEMPORARY MONITORING WELL TOTAL VOC CONCENTRATION IN GROUNDWATER (ug/L)

SCALE IN FEET
0 120 240 360

NOTES:

1. MONITORING WELL AOC9-MW19 IS A NEW WELL INSTALLED IN THE PLUME SOURCE AREA AFTER THE AOC9 GROUNDWATER REMEDY WAS COMPLETED, AND PRIOR TO PERFORMANCE MONITORING. AOC9-MW19 WAS INSTALLED AT THE LOCATION OF TEMPORARY WELL TW-39, WHICH CONTAINED 21,610 ug/L OF TOTAL VOCs IN GROUNDWATER.
2. WHEN DUPLICATE SAMPLES ARE COLLECTED, THE HIGHEST VALUE OBTAINED IS USED ON THIS FIGURE.
3. TOTAL VOC CONCENTRATIONS IN GROUNDWATER FOR:
   - AOC9-MW03, MW04, MW07, MW08 MW12, AND MW16 ARE SAMPLES COLLECTED DURING THE ON-BASE GROUNDWATER BASELINE SAMPLING IN 2006.
   - BEDROCK MONITORING WELLS AOC9-9Br, 10Br, AND 11Br ARE FROM SAMPLES COLLECTED DURING THE BEDROCK GROUNDWATER STUDY IN 2002.
   - MONITORING WELLS AOC9-MW13 AND WSAMW-4 ARE FROM SAMPLES COLLECTED IN 2004 DURING BASEWIDE GROUNDWATER MONITORING.

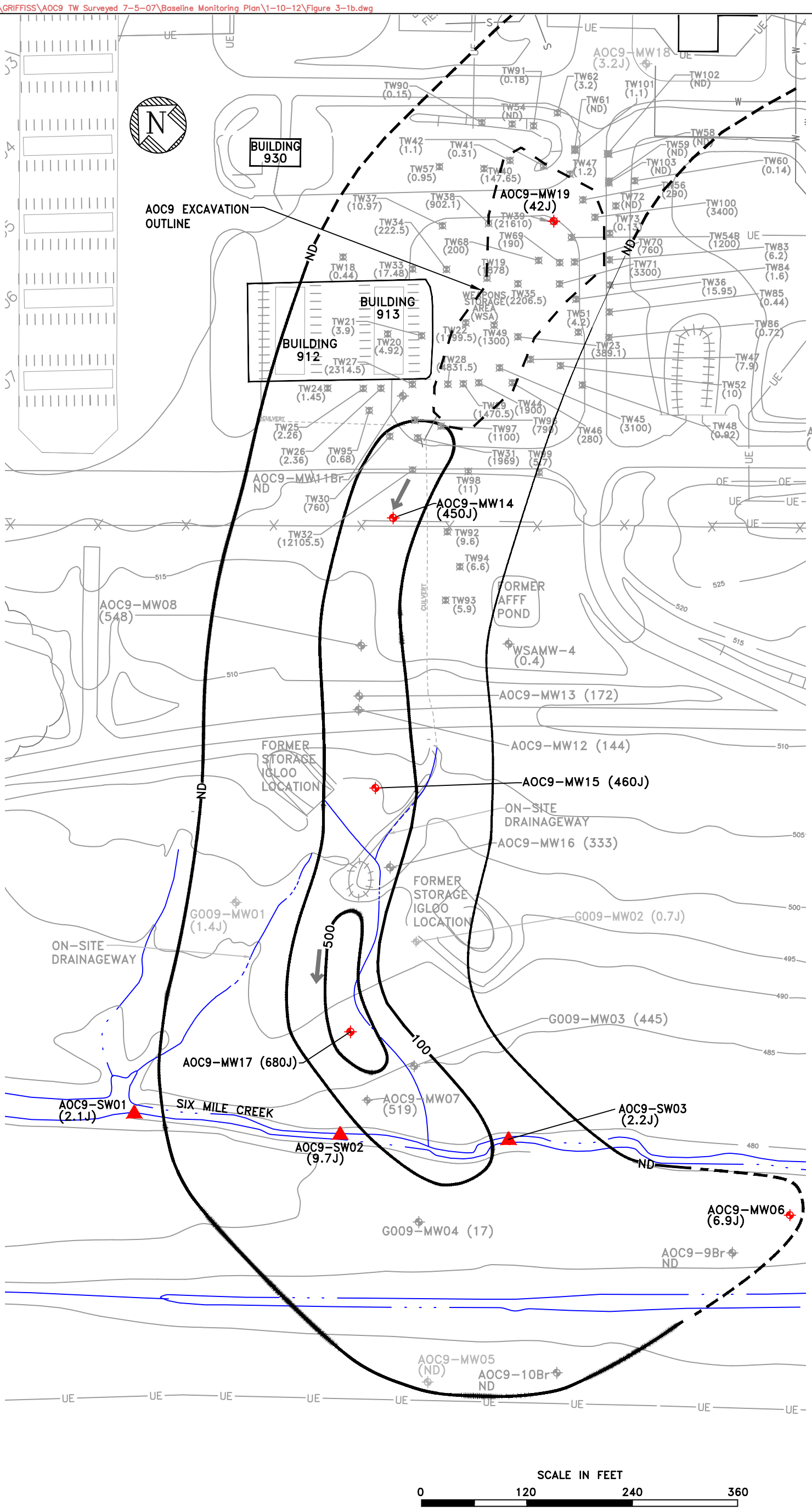
FORMER GRIFFISS AFB
AOC 9 SITE
ROME, NEW YORK

Prepared by:
ecology and environment engineering p.c.
In association with:
parsons

DRAWING TITLE: AOC9
MAY 2011 PERFORMANCE MONITORING TOTAL VOLATILE ORGANIC COMPOUND CONCENTRATIONS IN GROUNDWATER AND SURFACE WATER

FIGURE 3-1a

F:\GRIFFISS\AOC9 TW Surveyed 7-5-07\Baseline Monitoring Plan\1-10-12\Figure 3-1b.dwg



LEGEND

525	TOPOGRAPHIC CONTOUR LINE (CONTOUR INTERVAL = 5 FT)
ND	NOT DETECTED
10000	TOTAL VOC CONTOUR IN ug/L (DASHED WHERE INFERRED)
AOC9-MW14	PERFORMANCE MONITORING WELL SAMPLE LOCATION
AOC9-MW08 (548)	EXISTING WELL WITH HISTORIC TOTAL VOC CONCENTRATION IN GROUNDWATER (ug/L), SEE NOTES BELOW
(31)	OCTOBER 2011 PERFORMANCE SAMPLING TOTAL VOC CONCENTRATION IN GROUNDWATER AND SURFACE WATER (ug/L)
→	GROUNDWATER FLOW DIRECTION
▲	SURFACE WATER SAMPLING LOCATIONS
TW99 (5.7)	2006 AND 2007 PREDESIGN TEMPORARY MONITORING WELL TOTAL VOC CONCENTRATION IN GROUNDWATER (ug/L)

NOTES:

1. MONITORING WELL AOC9-MW19 IS A NEW WELL INSTALLED IN THE PLUME SOURCE AREA AFTER THE AOC9 GROUNDWATER REMEDY WAS COMPLETED, AND PRIOR TO PERFORMANCE MONITORING. AOC9-MW19 WAS INSTALLED AT THE LOCATION OF TEMPORARY WELL TW-39, WHICH CONTAINED 21,610 ug/L OF TOTAL VOCs IN GROUNDWATER.
2. WHEN DUPLICATE SAMPLES ARE COLLECTED, THE HIGHEST VALUE OBTAINED IS USED ON THIS FIGURE.
3. TOTAL VOC CONCENTRATIONS IN GROUNDWATER FOR:
   - AOC9-MW03, MW04, MW07, MW08 MW12, AND MW16 ARE SAMPLES COLLECTED DURING THE ON-BASE GROUNDWATER BASELINE SAMPLING IN 2006.
   - BEDROCK MONITORING WELLS AOC9-9Br, 10Br, AND 11Br ARE FROM SAMPLES COLLECTED DURING THE BEDROCK GROUNDWATER STUDY IN 2002.
   - MONITORING WELLS AOC9-MW13 AND WSAMW-4 ARE FROM SAMPLES COLLECTED IN 2004 DURING BASEWIDE GROUNDWATER MONITORING.

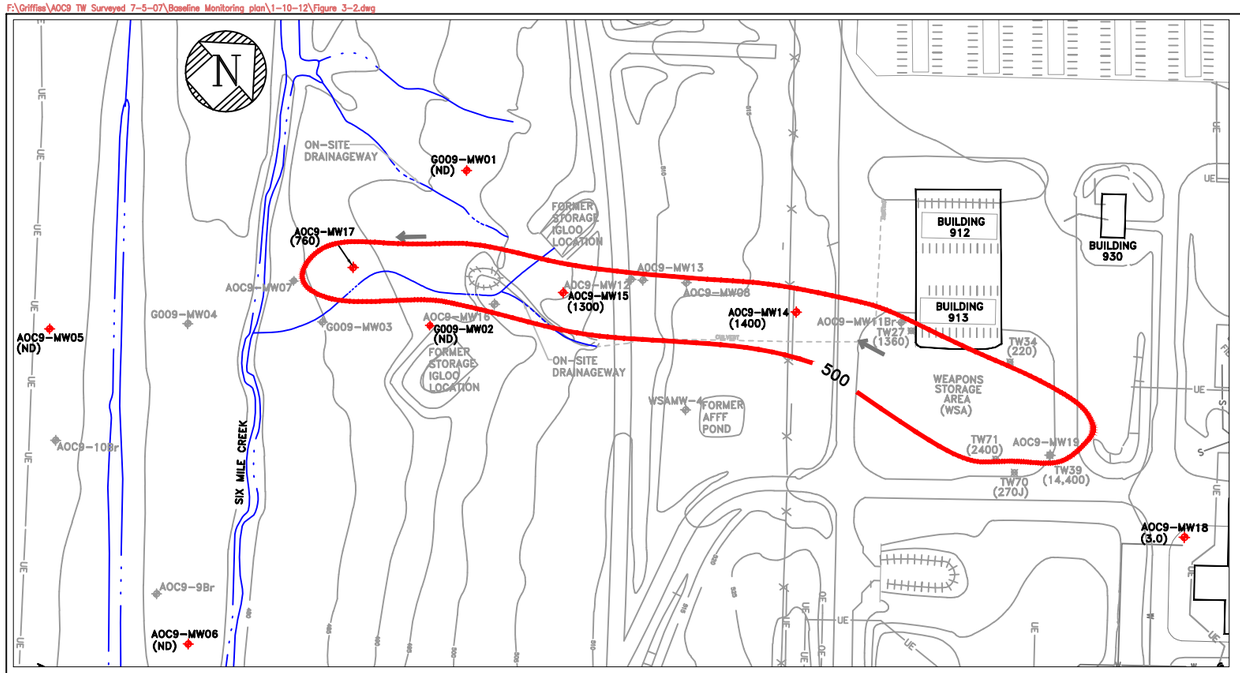
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ROME, NEW YORK

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parsons

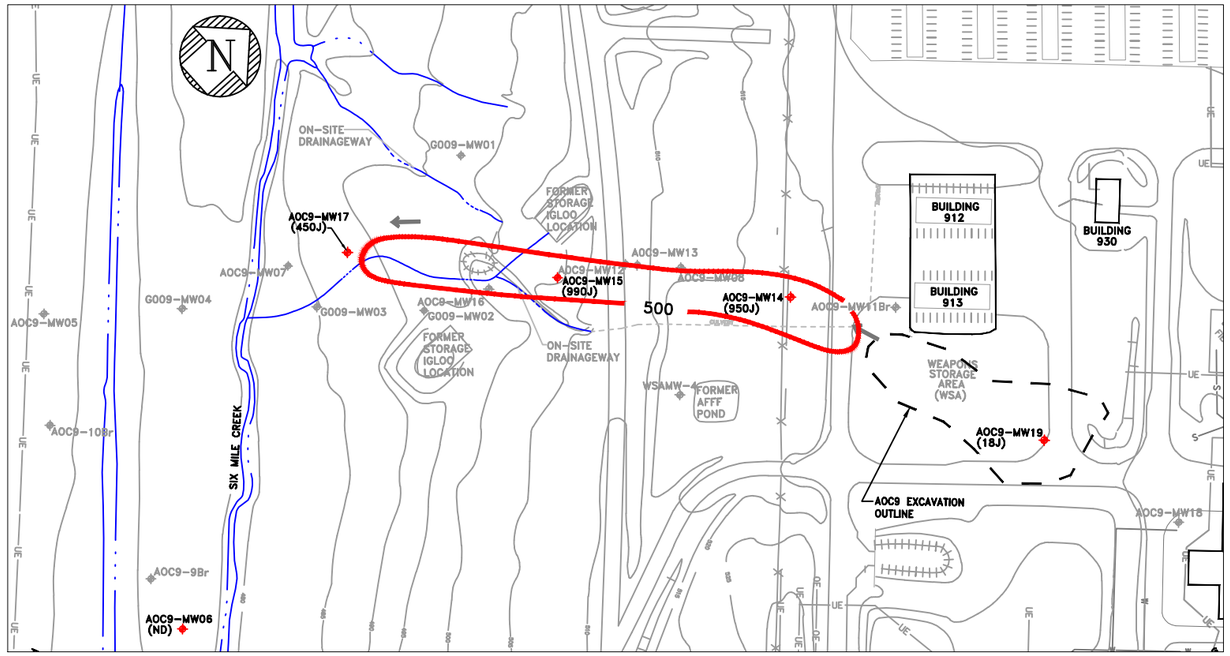
DRAWING TITLE: AOC9
OCTOBER 2011 PERFORMANCE MONITORING TOTAL VOLATILE ORGANIC COMPOUND CONCENTRATIONS IN GROUNDWATER AND SURFACE WATER

FIGURE 3-1b

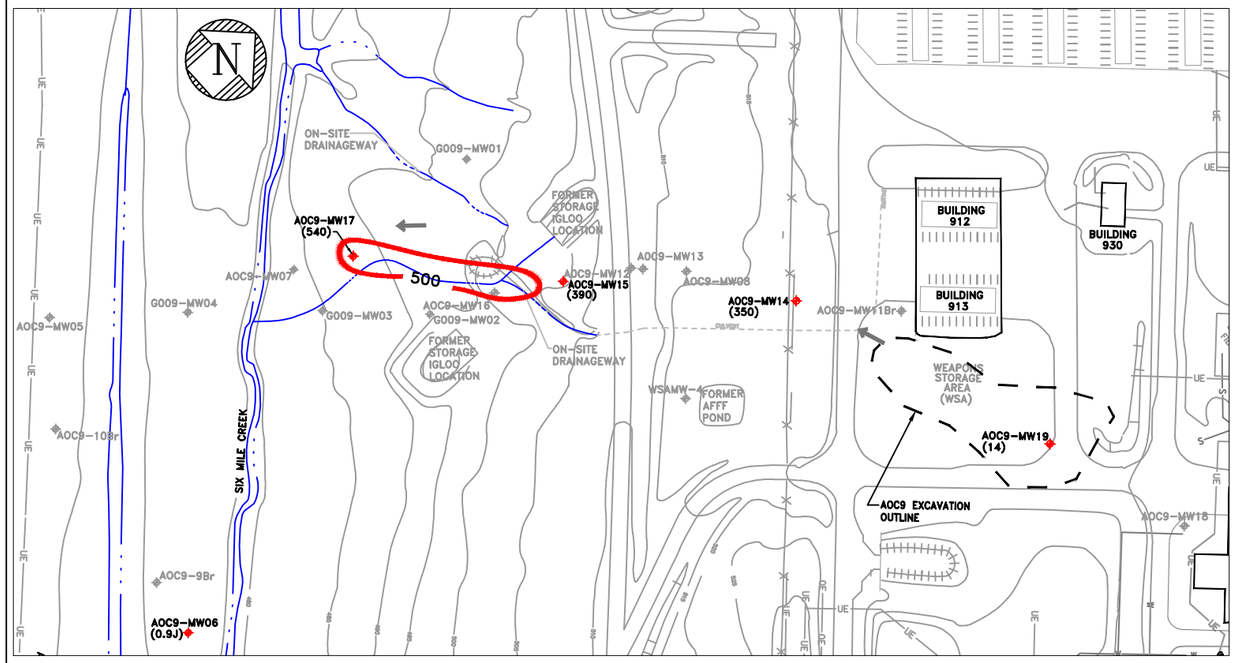
F:\Griffiss\AOC9 TW Surveyed 7-5-07\Baseline Monitoring plan\1-10-12\Figure 3-2.dwg



BASELINE SAMPLING JULY 2010



PERFORMANCE MONITORING MAY 2011



PERFORMANCE MONITORING OCTOBER 2011

RESERVED FOR FUTURE SAMPLING EVENT

LEGEND

- AOC9-MW14 — BASELINE MONITORING WELL SAMPLE LOCATION
- — EXISTING WELL
- 500 — CHLOROBENZENE PLUME CONTOUR IN PARTS PER BILLION
- 525 — TOPOGRAPHIC CONTOUR LINE (CONTOUR INTERVAL = 5 FT)
- → — GROUNDWATER FLOW DIRECTION
- (0.5J) — CHLOROBENZENE IN PARTS PER BILLION
- TW39 — PREDESIGN INVESTIGATION TEMPORARY MONITORING WELL
- (ND) — NOT DETECTED

SCALE IN FEET
0 200 400 600

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AOC 9 SITE
ROME, NEW YORK

NOTE: HISTORICAL MONITORING WELL DATA WAS USED TO ESTIMATE CONTOUR LINES WHEN NEW DATA WAS NOT AVAILABLE (SEE FIG 1-2).

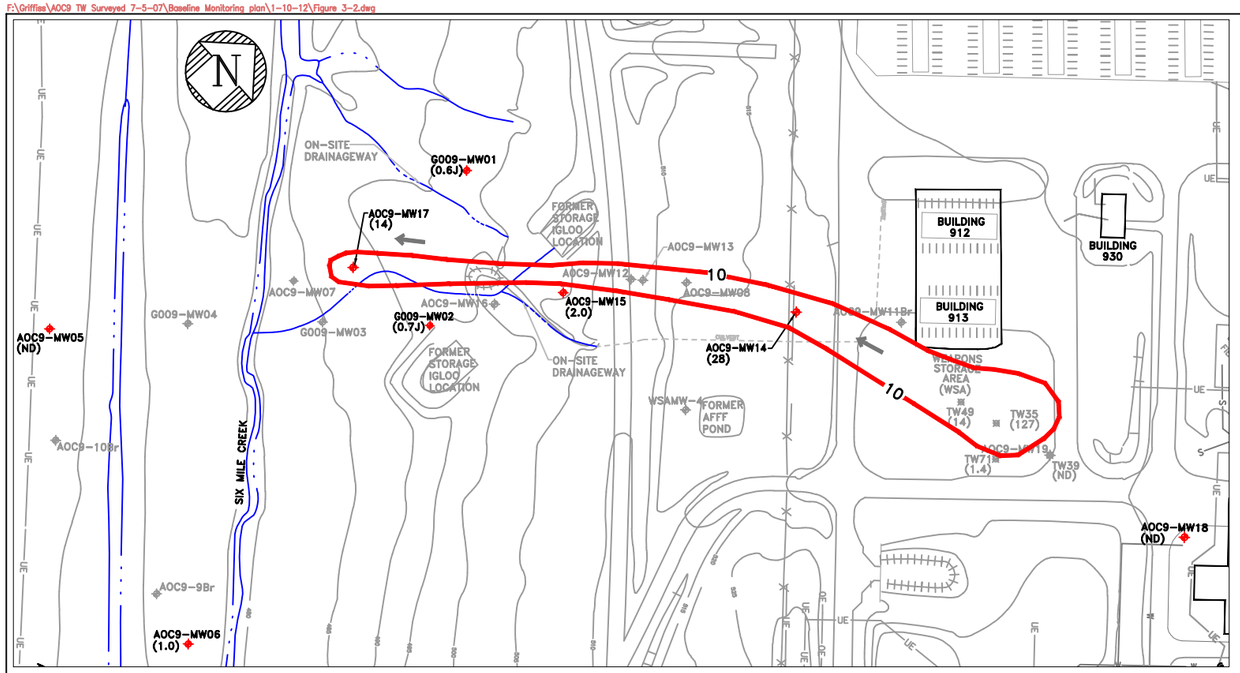
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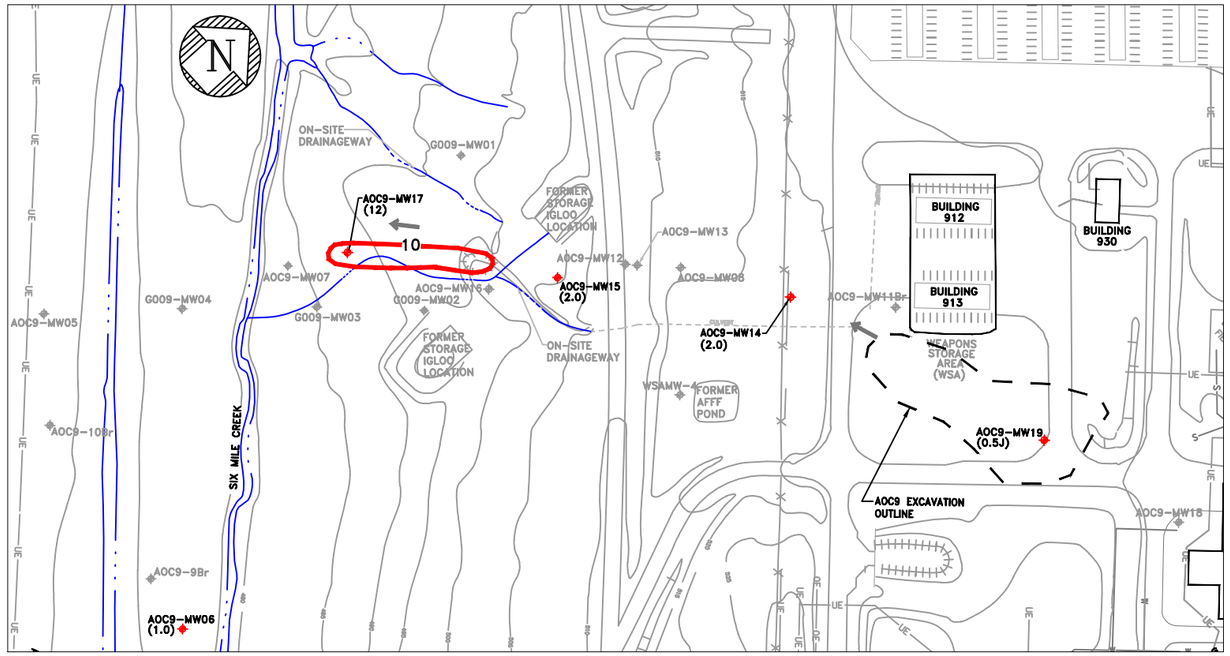
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AOC 9
PERFORMANCE MONITORING
CHLOROBENZENE PLUME

FIGURE 3-2

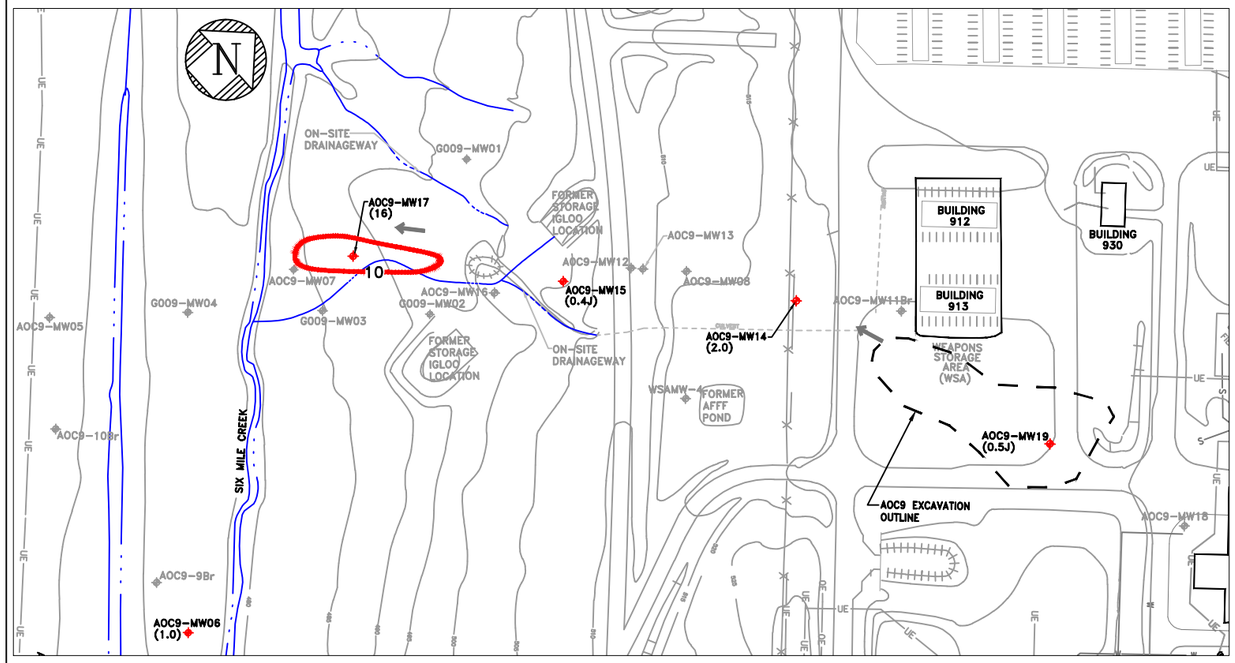
F:\Griffiss\AOC9 TW Surveyed 7-5-07\Baseline Monitoring plan\1-10-12\Figure 3-2.dwg



BASELINE SAMPLING JULY 2010



PERFORMANCE MONITORING MAY 2011



PERFORMANCE MONITORING OCTOBER 2011

RESERVED FOR FUTURE SAMPLING EVENT

LEGEND

- AOC9-MW14 — BASELINE MONITORING WELL SAMPLE LOCATION
- EXISTING WELL
- 10 — TCE PLUME CONTOUR IN PARTS PER BILLION
- 525 — TOPOGRAPHIC CONTOUR LINE (CONTOUR INTERVAL = 5 FT)
- TW39 — PREDESIGN INVESTIGATION TEMPORARY MONITORING WELL
- GROUNDWATER FLOW DIRECTION
- (ND) — NOT DETECTED
- (0.5J) — TCE IN PARTS PER BILLION

SCALE IN FEET
0 200 400 600

GRIFFISS AFB OBGW SITES
AOC 9 SITE
ROME, NEW YORK

NOTE: HISTORICAL MONITORING WELL DATA WAS USED TO ESTIMATE CONTOUR LINES WHEN NEW DATA WAS NOT AVAILABLE (SEE FIG 1-2).

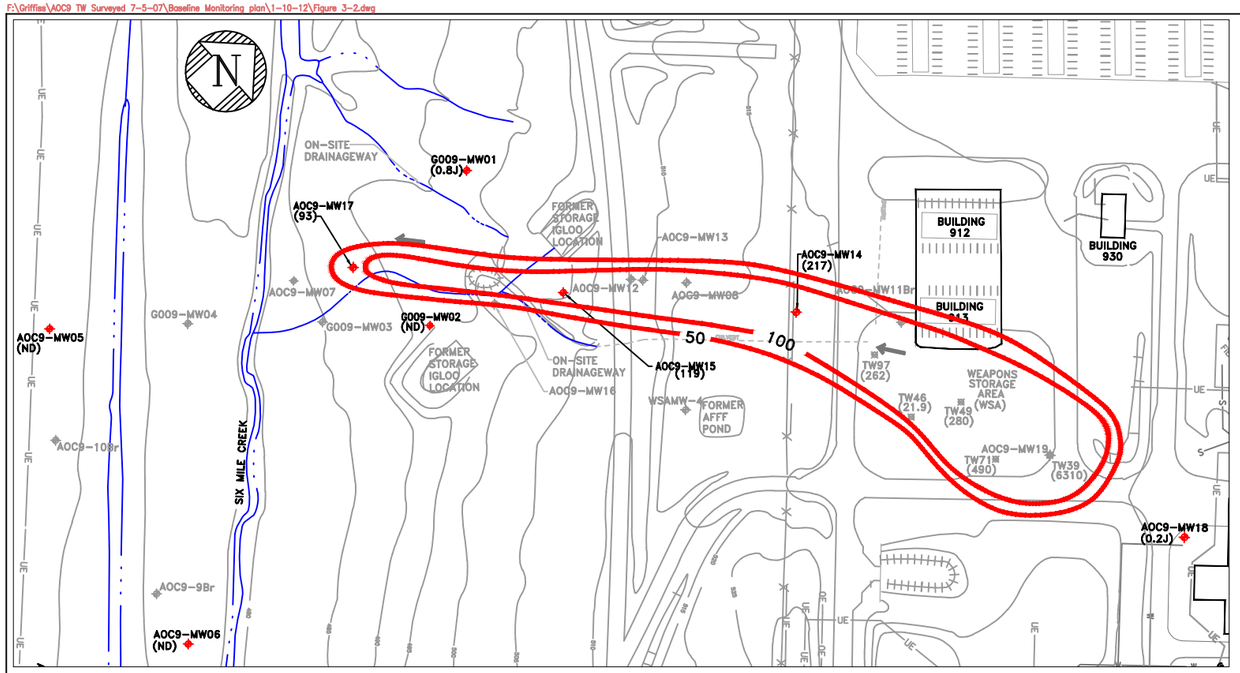
Prepared by: ecology and environment engineering p.c.

In Association with: parsons

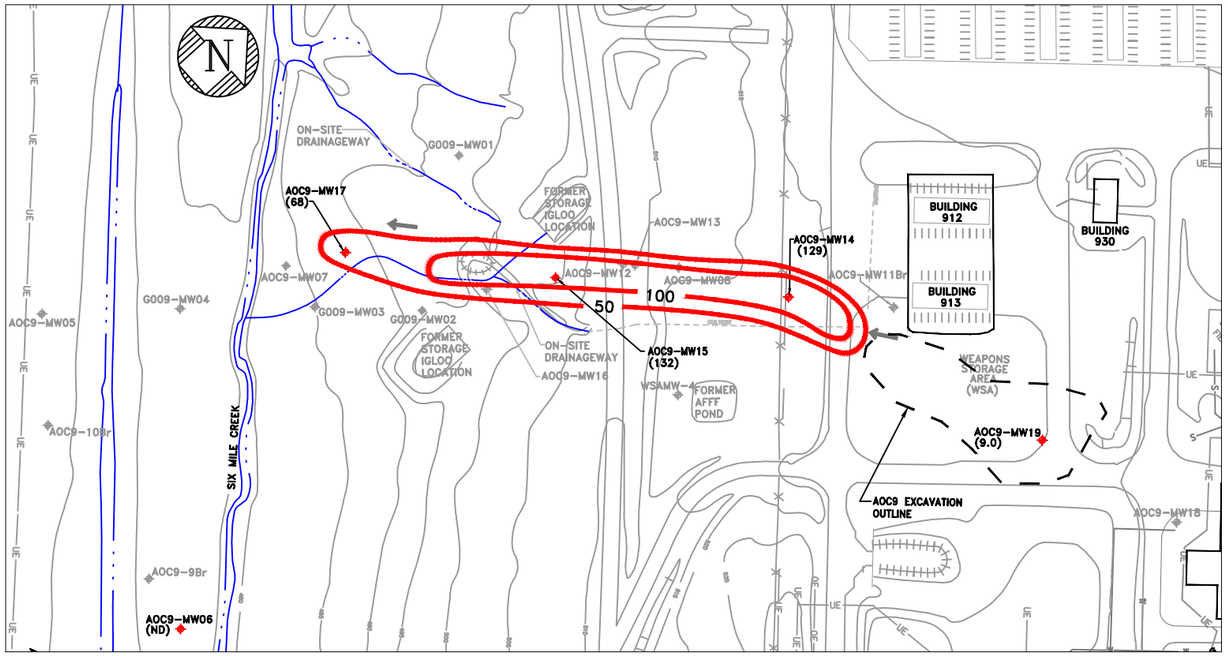
DRAWING TITLE:
AOC 9
PERFORMANCE MONITORING
TCE PLUME

FIGURE 3-3

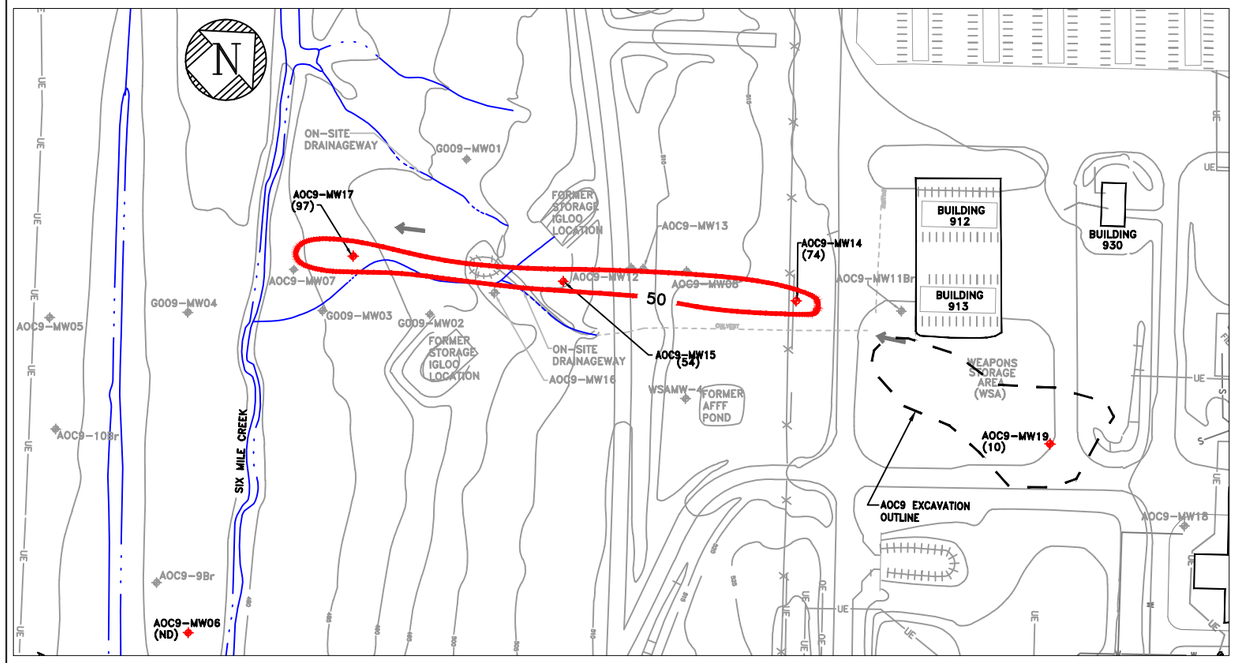
F:\Griffiss\AOC9 TW Surveyed 7-5-07\Baseline Monitoring plan\1-10-12\Figure 3-2.dwg



BASELINE SAMPLING JULY 2010



PERFORMANCE MONITORING MAY 2011



PERFORMANCE MONITORING OCTOBER 2011

RESERVED FOR FUTURE SAMPLING EVENT

LEGEND

- AOC9-MW14 — BASELINE MONITORING WELL SAMPLE LOCATION
- EXISTING WELL
- 50 — TOTAL DCB PLUME CONTOUR IN PARTS PER BILLION
- 525 — TOPOGRAPHIC CONTOUR LINE (CONTOUR INTERVAL = 5 FT)
- GROUNDWATER FLOW DIRECTION
- (0.5J) — TOTAL DCB IN PARTS PER BILLION
- TW39 — PREDESIGN INVESTIGATION TEMPORARY MONITORING WELL
- (ND) — NOT DETECTED

SCALE IN FEET
0 200 400 600

GRIFFISS AFB OBGW SITES
AOC 9 SITE
ROME, NEW YORK

NOTE: HISTORICAL MONITORING WELL DATA WAS USED TO ESTIMATE CONTOUR LINES WHEN NEW DATA WAS NOT AVAILABLE (SEE FIG 1-2).

Prepared by: ecology and environment engineering p.c.

In Association with: parsons

DRAWING TITLE:
AOC 9
PERFORMANCE MONITORING
TOTAL DCB PLUME

FIGURE 3-4

Figure 3-5 AOC9-MW06 Trend Analysis

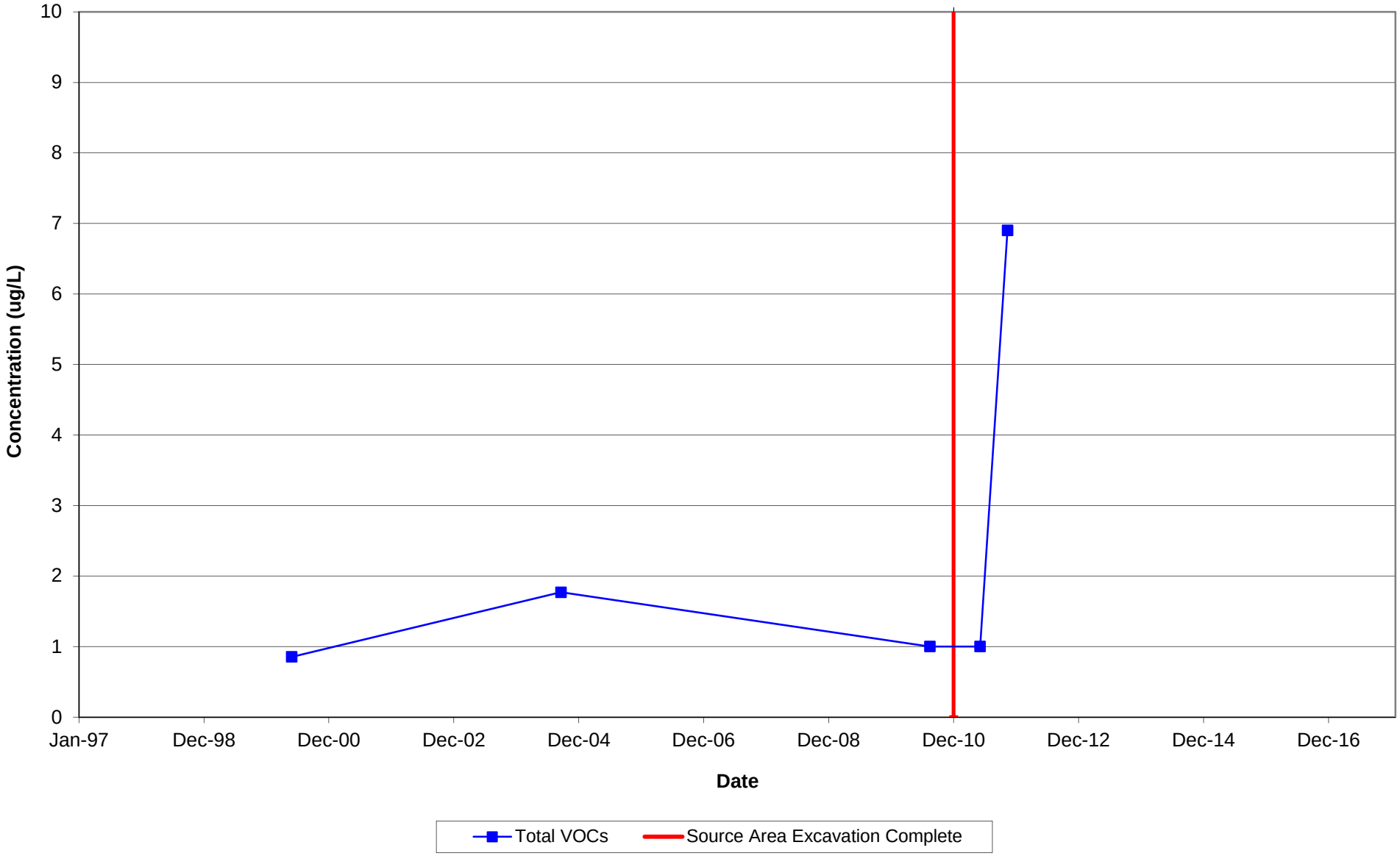


Figure 3-6 AOC9-MW14 Trend Analysis

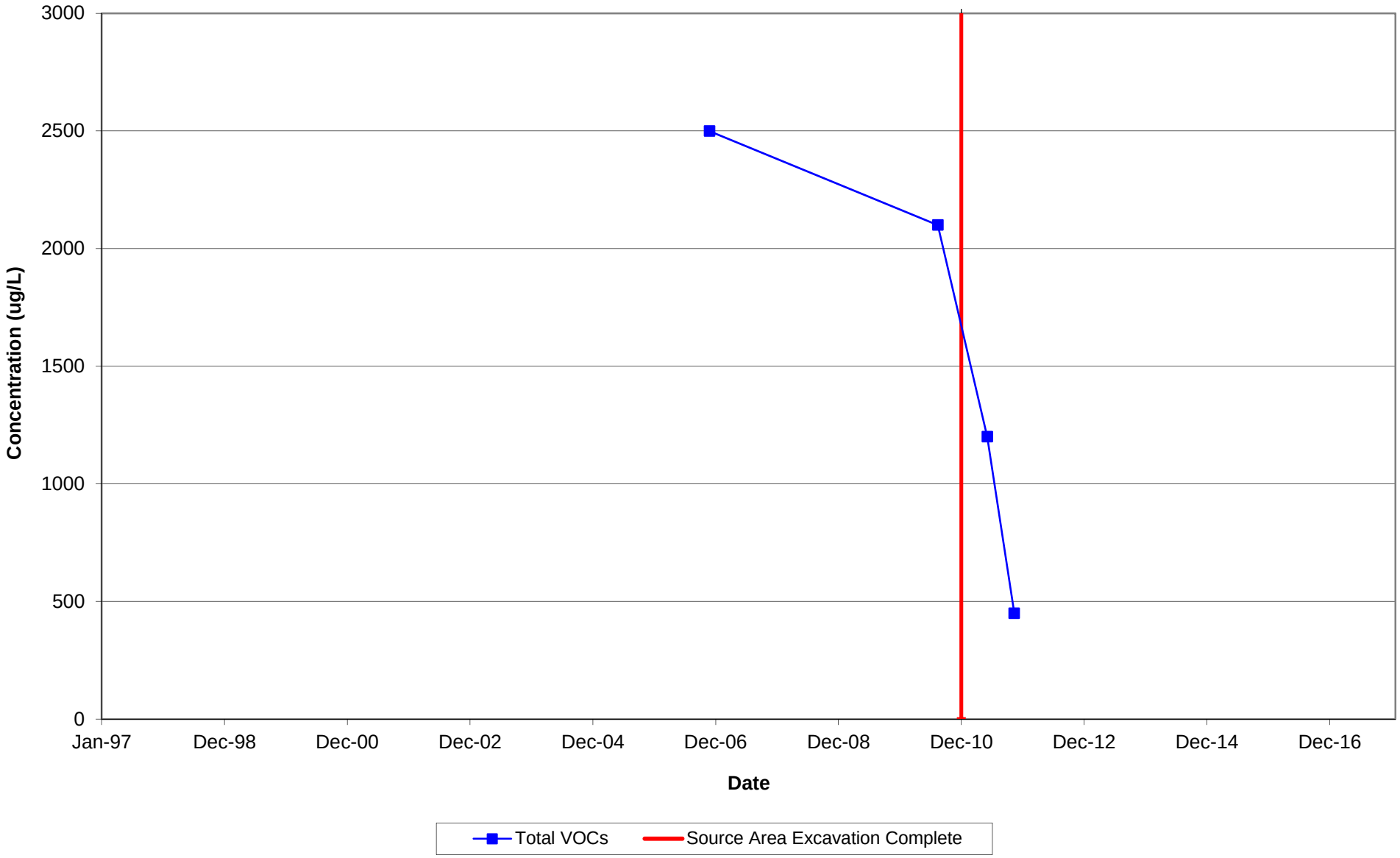


Figure 3-7 AOC9-MW15 Trend Analysis

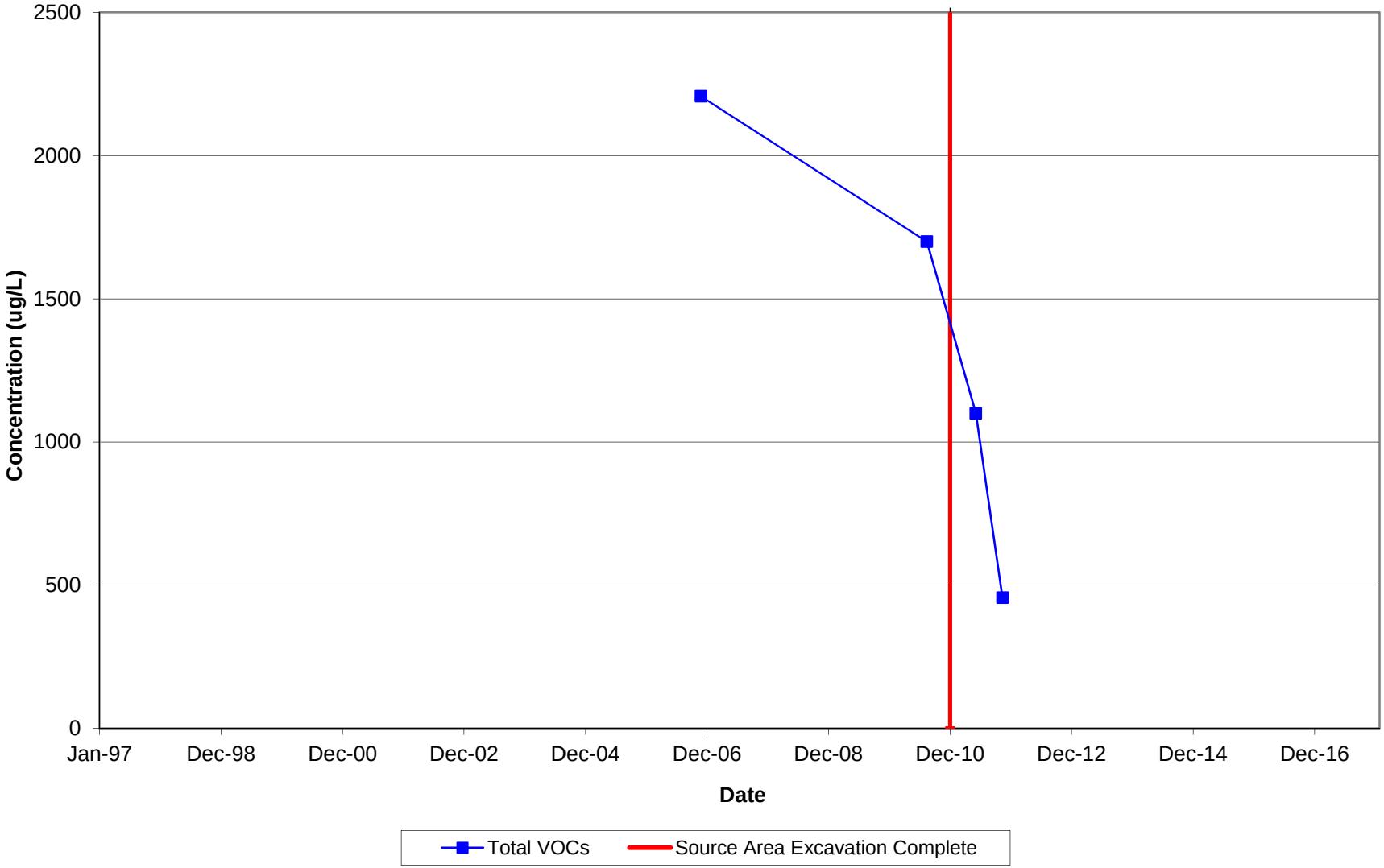


Figure 3-8 AOC9-MW17 Trend Analysis

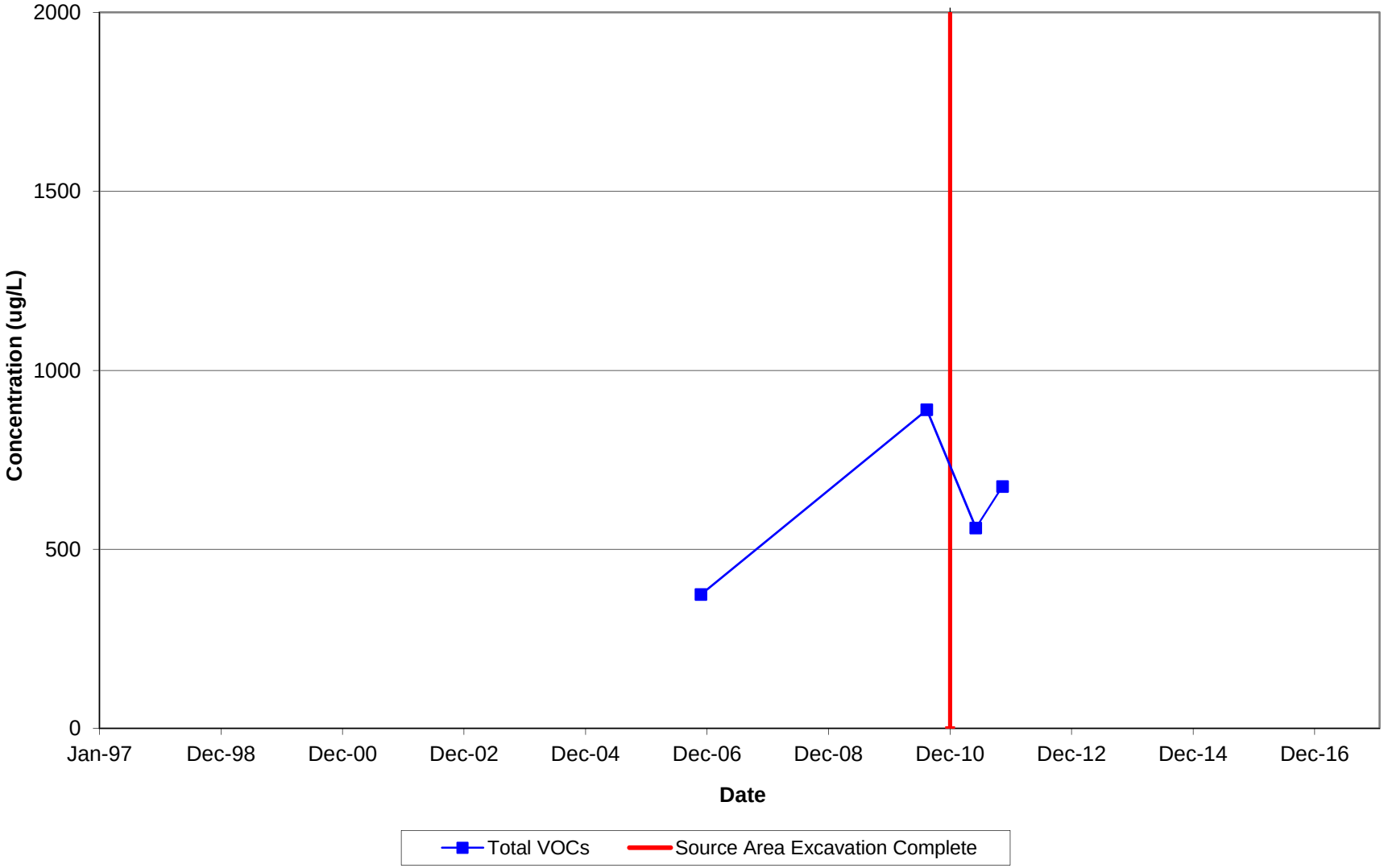
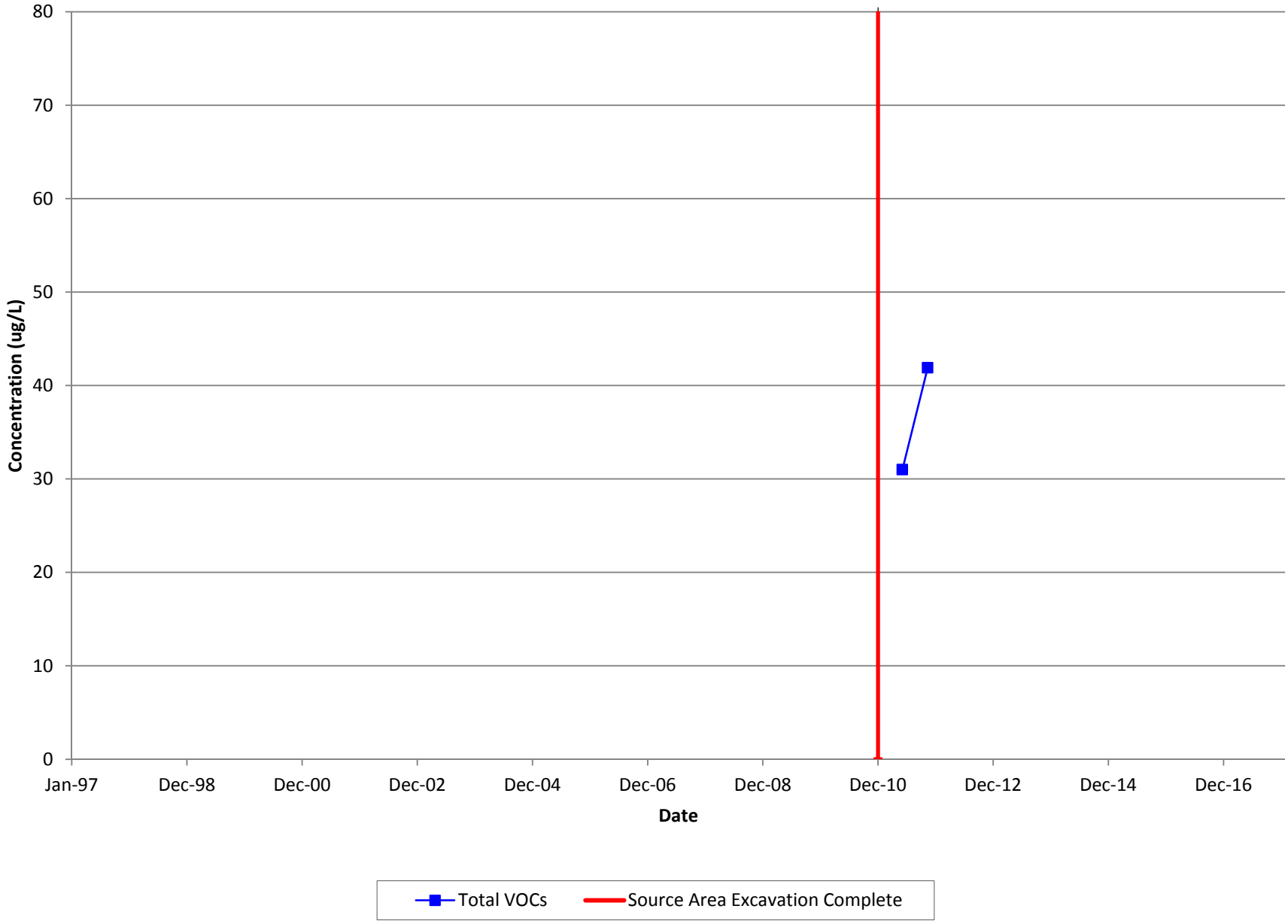


Figure 3-9 AOC9-MW19 Trend Analysis



4 References

Ecology and Environment Engineering, P.C. (EEEPC). 2010a. *Final Record of Decision for Area of Concern 9 (SD-62) at the Former Griffiss Air Force Base, Rome, New York.* July 2010.

_____. 2010b. *Final Area of Concern (AOC) 9 Feasibility Study Addendum, Former Griffiss Air Force Base, Rome, New York.* March 2010.

_____. 2010c. *Final Baseline Monitoring Data Summary Report, AOC 9 Former Griffiss Air Force Base, Rome, New York*. November 2010.

_____. 2010d. *Final Remedial Design Work Plan and Construction Drawings for Area of Concern (AOC) 9 Former Griffiss Air Force Base, Rome, New York*, September 2010.

_____. 2010e. *Final Work Plan Baseline, Performance, and Long-Term Monitoring at AOC 9 Former Griffiss Air Force Base, Rome, New York*. June 2010.

Ecology and Environment, Inc. (E & E). July 1998. *Draft Report for Expanded Site Investigation and Confirmatory Sampling of Areas of Interest and Drywell/Wastewater-Related Systems, Former Griffiss Air Force Base, Rome, New York*.

New York State Department of Environmental Conservation (NYSDEC). 2009. Draft DER-10 Technical Guidance for Site Investigation and Remediation. November.

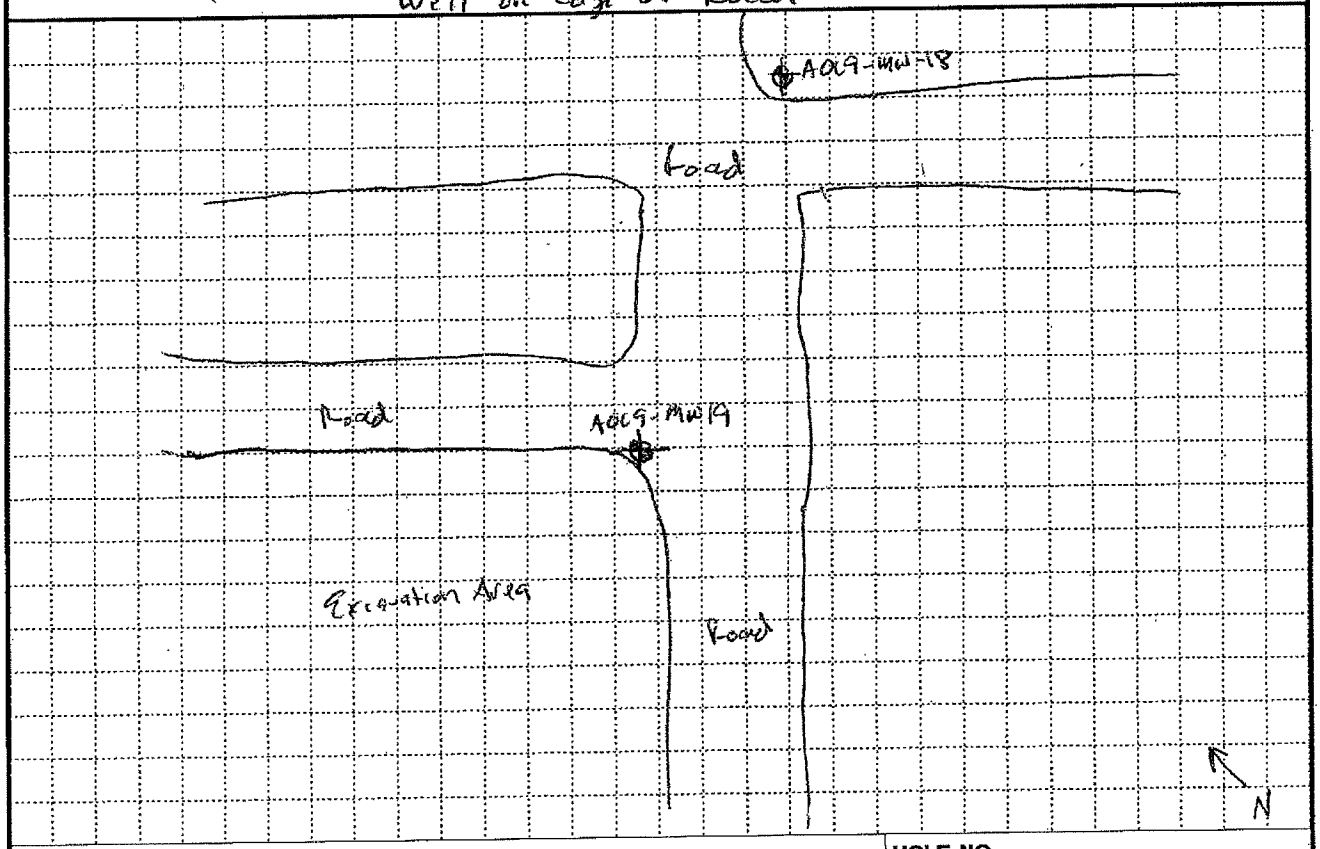
United States Environmental Protection Agency (EPA). 2006. National Primary Drinking Water Standards. January 23, 2006 update.

A AOC 9-MW19 Drilling Log and Well Development Record

HTRW DRILLING LOG

District		Hole Number
1. Company Name: Parsons	2. Drill Subcontractor: Atlantic Testing Laboratories	Sheet / Sheets: of
3. Project: AOC-9	4. Location: AOC-9	
5. Name of Driller: Brad Perry	6. Manufacturer's Designation of Drill: CME-850	
7. Sizes and Types of Drilling and Sampling Equipment: 4¼ auger; 4 1/2" ID 8" OD	8. Hole Location: AOC 9 - MW19	
	9. Surface Elevation	
	10. Date Started: 4/7/11	11. Date Completed: 4/7/11
12. Overburden Thickness: 20'	15. Depth Groundwater Encountered: 7'	
13. Depth Drilled Into Rock: Not encountered	16. Depth to Water and Elapsed Time After Drilling Completed: ~~7'~~ n	
14. Total Depth of Hole: 20'	17. Other Water Level Managements (Specify)	
18. Geological Samples: Ø; Disturbed	Undisturbed	19. Total Number of Core Boxes
20. Samples For Chemical Analysis: None; VOC: 0.0ppm; Metals	Other (Specify) / Other (Specify) / Other (Specify)	21. Total Core Recovery %
22. Disposition of Hole: Well installed; Backfilled; Monitoring Well	Other (Specify)	23. Signature of Inspector: Allen Munger

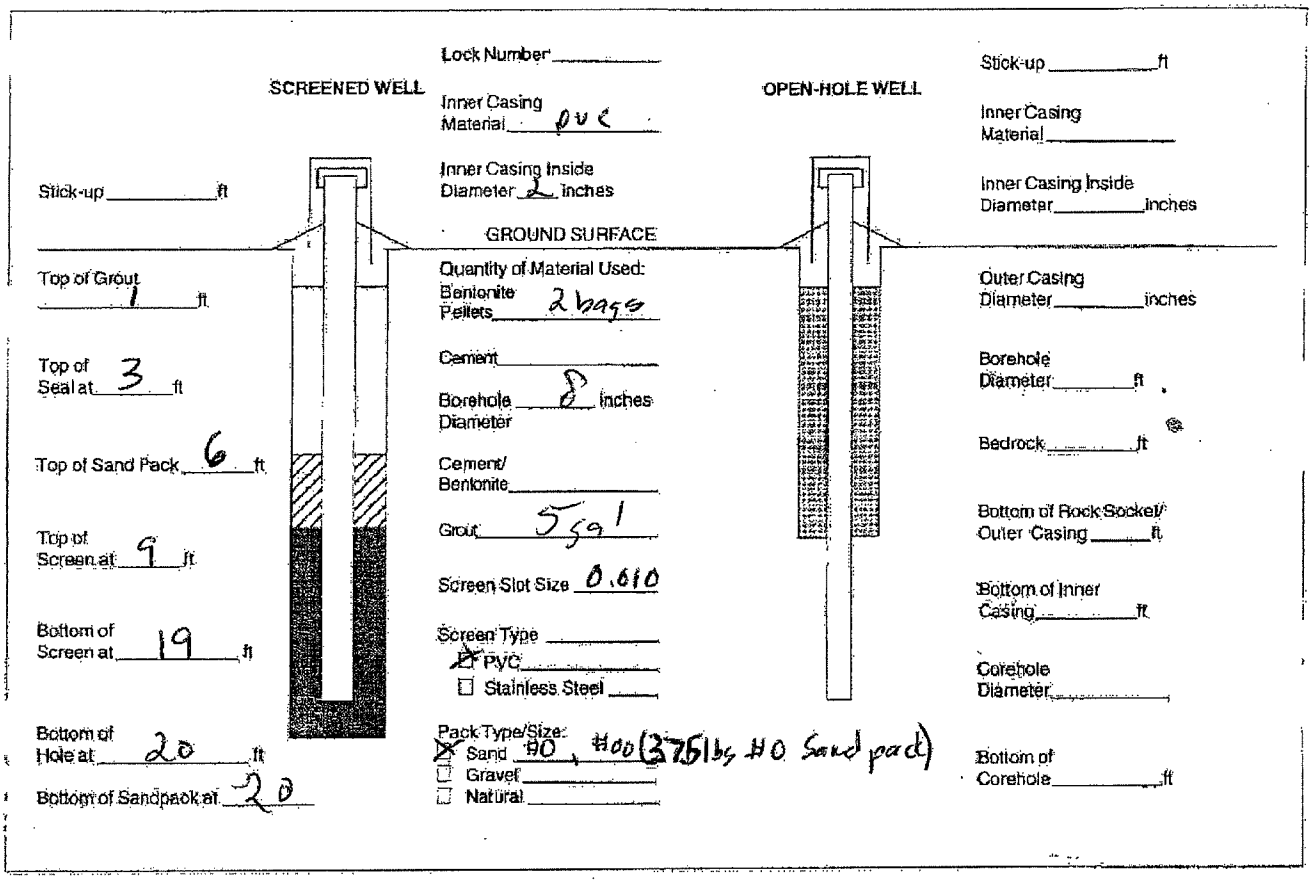
LOCATION SKETCH/COMMENTS Well on Edge of Road **SCALE:**



PROJECT	HOLE NO.

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

Figure 3-2 Hazardous, Toxic, and Radioactive Waste Drill Log Form



Depth (Feet)	NARRATIVE LITHOLOGIC DESCRIPTION	Moisture Content Dry	Moist	Wet
0-14'	moist-wet brown sand, small fine angular gravel (Fill)	○	⊗	○
14-20'	wet, brown, fine sand	○	○	⊗
		○	○	○
		○	○	○
		○	○	○
		○	○	○
		○	○	○
		○	○	○
		○	○	○
		○	○	○
		○	○	○
		○	○	○
		○	○	○
		○	○	○
		○	○	○

Figure 3-2 (Cont.) Hazardous, Toxic, and Radioactive Waste Drill Log Form

HTRW DRILLING LOG (Continuation Sheet)

Hole Number

Project: GAFB AOC9 -MW19 | Inspector: A. Menges | Sheet ___ Sheets ___ of

Elevation (A)	Depth (B)	Description of Materials (C)	Field Screening Results (D)	Geotech Sample or Core Box No. (E)	Analytical Sample No. (F)	Blow Count (G)	Remarks (H)
		moist, ~~loose~~ ~~stiff~~, brown f-c sand, trace f gravel	0.0ppm			2/2 3/2	SW
	2ft						
		SAA	0.0ppm			4/4 4/7	SW
	4ft						
		moist, ~~loose~~ ~~stiff~~, brown, f-c sand, trace silt, trace f gravel	1.9 ppm			5/7 8/7	SW
	6ft						
		wet, ~~loose~~ ~~stiff~~, brown, f-c sand, trace silt, trace f gravel	1.6 ppm			8/9 9/10	SW
	8ft						
		SAA	1.1 ppm			10/11 11/12	SW
	10ft						
		SAA	0.1ppm			15/11 9/9	SW
	12ft						
		SAA	0.2 ppm			6/6 4/3	SW
	14ft						
		wet, ~~stiff~~ loose, brown f-c sand	0.0ppm			4/6 9/11	SW
	16ft						
		SAA	0.0ppm			10/11 10/12	SW
	18ft						
		SAA	0.0ppm			5/10 11/12	SW
	20ft						

PROJECT | HOLE NO.

ENG FORM 5056A-R, AUG 94 (Proponent: CECW-EG)

Figure 3-2 (Cont.) Hazardous, Toxic, and Radioactive Waste Drill Log Form

WELL DEVELOPMENT RECORD

SITE GAFB DATE 9/14/11

LOCATION AOC 9 WELL NO. AOC9-MW19

MEASUREMENT OF WATER LEVEL AND WELL VOLUME

- Prior to sampling, the static water level and total depth of the well will be measured with a calibrated weighted line. Care will be taken to decontaminate equipment between each use to avoid cross contamination of wells.
- The number of linear feet of static water (difference between static water level and total depth of well) will be calculated.
- The static volume will be calculated using the formula:

$$V = Tr^2(0.163)$$

Where:
V = Static volume of well in gallons;
T = Depth of water in the well, measured in feet;
r = Inside radius of well casing in inches;
and 0.163 = A constant conversion factor which compensates for r^2h factor for the conversion of the casing radius from inches to feet, the conversion of cubic feet to gallons, and (π).
1 well volume (v) = 1.7 gallons.

Volume of Water in Casing or Hole

Diameter of Casing or Hole (in)	Gallons per Foot of Depth	Cubic Feet per Foot of Depth	Liter per Meter of Depth	Cubic Meters per Meter of Depth
1	0.041	0.0055	0.509	0.509×10^{-3}
1 1/2	0.092	0.0123	1.142	1.142×10^{-3}
2	0.163	0.0218	2.024	2.024×10^{-3}
2 1/2	0.255	0.0341	3.167	3.167×10^{-3}
3	0.367	0.0491	4.556	4.556×10^{-3}
3 1/2	0.500	0.0668	6.209	6.209×10^{-3}
4	0.653	0.0873	8.110	8.110×10^{-3}
4 1/2	0.826	0.1104	10.260	10.260×10^{-3}
5	1.020	0.1364	12.670	12.670×10^{-3}
5 1/2	1.234	0.1650	15.330	15.330×10^{-3}
6	1.469	0.1963	18.240	18.240×10^{-3}
7	2.000	0.2673	24.840	24.840×10^{-3}
8	2.611	0.3491	32.430	32.430×10^{-3}
9	3.305	0.4418	41.040	41.040×10^{-3}
10	4.080	0.5454	50.670	50.670×10^{-3}
11	4.937	0.6600	61.310	61.310×10^{-3}
12	5.875	0.7854	72.960	72.960×10^{-3}
14	8.000	1.0690	99.350	99.350×10^{-3}
16	10.440	1.3960	129.650	129.650×10^{-3}
18	13.220	1.7670	164.180	164.180×10^{-3}
20	16.320	2.1820	202.680	202.680×10^{-3}
22	19.750	2.6400	245.280	245.280×10^{-3}
24	23.500	3.1420	291.850	291.850×10^{-3}
26	27.580	3.6870	342.520	342.520×10^{-3}
28	32.000	4.2760	397.410	397.410×10^{-3}
30	36.720	4.9090	456.020	456.020×10^{-3}
32	41.760	5.5850	518.870	518.870×10^{-3}
34	47.160	6.3050	585.680	585.680×10^{-3}
36	52.880	7.0690	656.720	656.720×10^{-3}

1 Gallon = 3.785 liters
1 Meter = 3.281 feet
1 Gallon water weighs 8.33 lbs. = 3.779 kilograms
1 Liter water weighs 1 kilogram = 2.205 pounds
1 Gallon per foot of depth = 12.419 liters per foot of depth
1 Gallon per meter of depth = 12.419×10^{-3} cubic meters per meter of depth

INITIAL DEVELOPMENT WATER

WATER LEVEL (TOIC) 8.2 ft bgs
WELL DEPTH (TD) 19.0 ft
COLOR Brown
ODOR NA
CLARITY Turbid

FINAL DEVELOPMENT WATER

WATER LEVEL (TOIC) 15.8 ft
WELL DEPTH (TD) 19.0 ft
COLOR Clear
ODOR N/A
CLARITY Clear

DESCRIPTION OF DEVELOPMENT TECHNIQUE Peristaltic pump with dedicated tubing with a flow through cell to collect field parameters

Figure 3-3 Well Development Record

WELL DEVELOPMENT - PARAMETER MEASUREMENTS

TIME	TOTAL VOL. WITHDRAWN		pH	COND. (umhos/cm)	TEMP (°C/°F)	TURB. (NTU)	COMMENTS
	GALS.	BORE VOL.					
0930	5	2.9	7.30	0.452	9.56	~~0~~444	water very turbid
0940	6	3.5	7.32	0.452	9.36	555	
0950	6.5	3.8	7.35	0.448	9.44	380	
0955	7	4.1	7.32	0.444	9.44	248	
1000	7.25	4.2	7.35	0.439	9.40	177	
1005	7.5	4.4	7.34	0.436	9.46	140	
1010	8	4.7	7.39	0.435	9.54	111	
1015	8.5	5	7.37	0.436	9.54	82	water slightly turbid
1020	9	5.2	7.38	0.438	9.76	59	
1025	9.5	5.5	7.37	0.436	9.63	47	
1030	10	5.8	7.36	0.432	9.59	40	
1035	10.5	6.1	7.37	0.428	9.56	30	
1040	11	6.4	7.37	0.434	9.77	28	water clear

DEVELOPED BY: Allison Menges DATE: 4/14/11

Figure 3-3 (Cont.) Well Development Record

B AOC 9-MW19 Survey Data

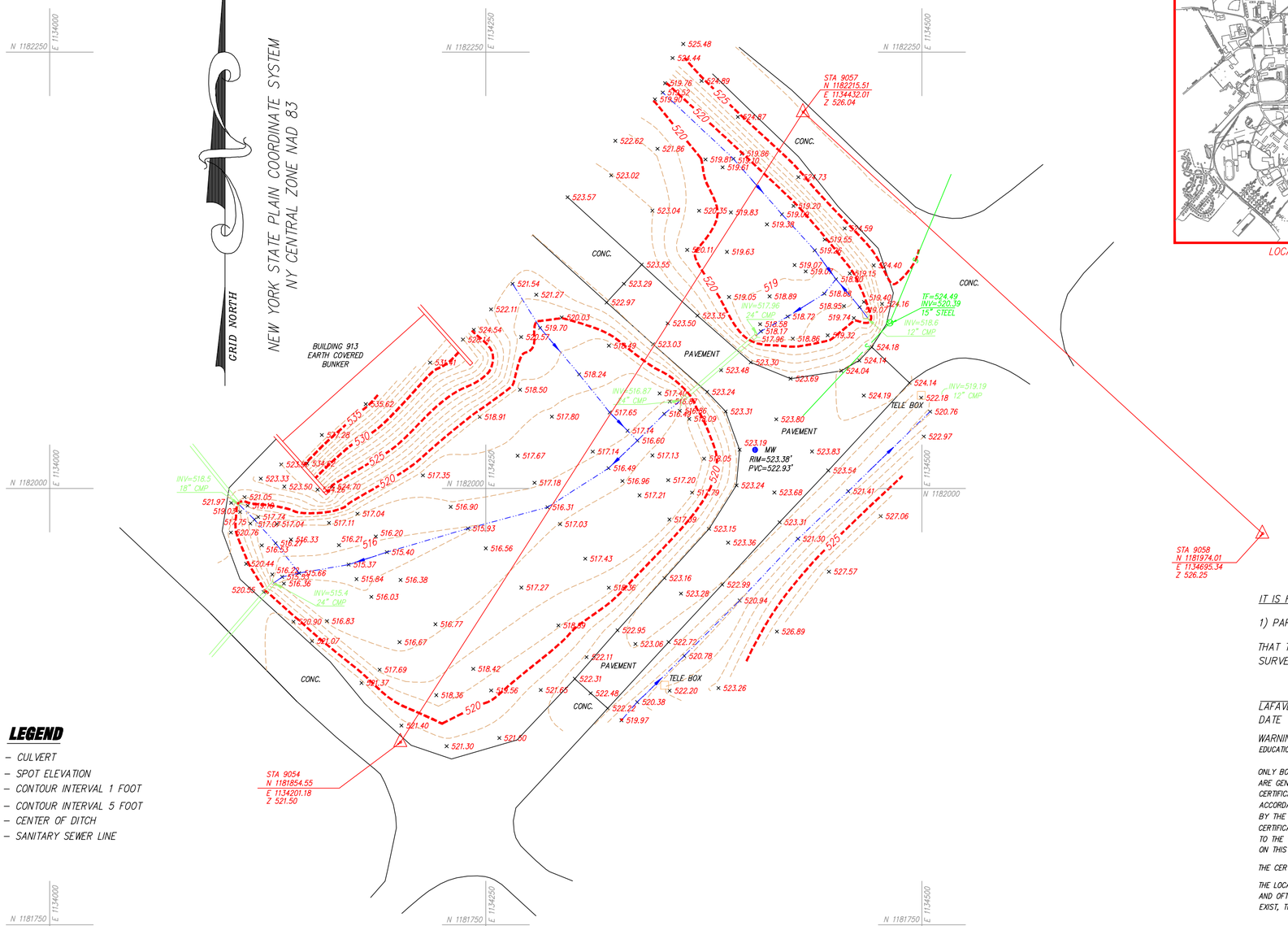
GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

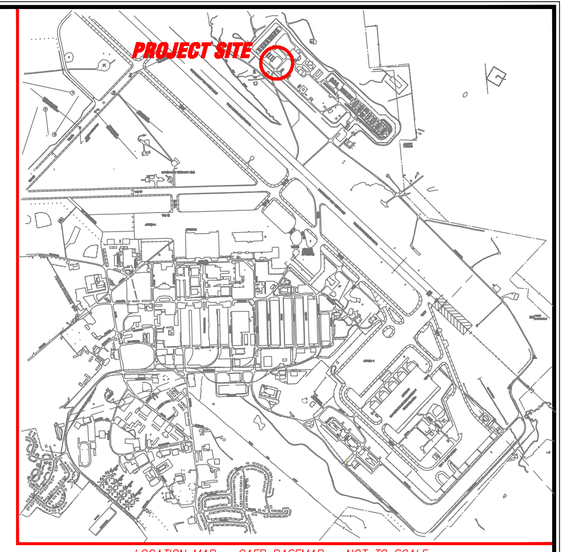
GRID NORTH

NEW YORK STATE PLAIN COORDINATE SYSTEM
NY CENTRAL ZONE NAD 83



LEGEND

- CULVERT
- 523.26 – SPOT ELEVATION
- CONTOUR INTERVAL 1 FOOT
- CONTOUR INTERVAL 5 FOOT
- CENTER OF DITCH
- S – SANITARY SEWER LINE



LOCATION MAP – GAFB BASEMAP – NOT TO SCALE

IT IS HEREBY CERTIFIED TO:

1) PARSONS ENGINEERING

THAT THIS MAP WAS PREPARED FROM AN ACTUAL FIELD SURVEY PERFORMED UNDER MY DIRECT SUPERVISION.

LAFAVE WHITE & MCGIVERN, L.S. P.C. AST. SURVEY SUPERVISOR
DATE ANDREW R. BAILEY P.L.S. N.Y.S. LIC. NO. 50437

WARNING– IT IS A VIOLATION OF SECTION 7209, SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW FOR ANY PERSON OTHER THAN A LICENSED LAND SURVEYOR TO ALTER THIS MAP.

ONLY BOUNDARY SURVEY MAPS WITH THE SURVEYORS EMBOSED SEAL OR RED INK SEAL ARE GENUINE TRUE AND CORRECT COPIES OF THE SURVEYOR'S ORIGINAL WORK & OPINION CERTIFICATIONS ON THIS BOUNDARY SURVEY MAP SIGNIFY THAT THE MAP WAS PREPARED IN ACCORDANCE WITH THE CURRENT EXISTING CODE OF PRACTICE FOR LAND SURVEYS ADOPTED BY THE NEW YORK STATE ASOCIATION OF PROFESIONAL LAND SURVEYORS, INC. THE CERTIFICATION IS LIMITED TO PERSONS FOR WHOM THE BOUNDARY SURVEY MAP IS PREPARED, TO THE TITLE COMPANY, TO THE GOVERNMENT AGENCY, AND THE LENDING INSTITUTION LISTED ON THIS BOUNDARY SURVEY MAP.

THE CERTIFICATIONS HEREON ARE NOT TRANSFERABLE.

THE LOCATION OF UNDERGROUND IMPROVEMENTS OR ENCROACHMENTS ARE NOT ALWAYS KNOWN AND OFTEN MUST BE ESTIMATED. IF ANY UNDERGROUND IMPROVEMENTS OR ENCROACHMENTS EXIST, THEY ARE NOT COVERED BY THIS CERTIFICATIONS

REV	DESCRIPTION	DATE

FINAL ASBUILT– TOPOGRAPHIC SURVEY MAP

AOC9-BLDG NO. 913-FORMER GRIFFIS AIR FORCE BASE

PARSONS PROJECT 747054-AOC-9

CITY OF ROME

ONEIDA COUNTY NEW YORK

LaFAVE, WHITE & McGIVERN, L.S., P.C.

LAND SURVEYORS PHOTOGRAMMETRISTS

THERESA BOONVILLE ROME

NEW YORK

DRAWN	CHECKED	DATE	SCALE	FILE	SHEET
T.J.B	A.R.B.	11/28/2011	1" = 50'	10-P02-RO	1 OF 1

C Disposal Manifest Form

723729071 SC PPW 3/3/2011

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
	NY4571924451	1	(800) 483-3718	004397809 FLE

5. Generator's Name and Mailing Address
AFRPA AFCEE EXC-Griffiss
428 Phoenix Drive
Rome, NY 13441
Generator's Phone 315-356-0810

Generator's Site Address (if different than mailing address)
McPike Road
Rome,NY 13441

6. Transporter 1 Company Name
Clean Harbors Environmental Services Inc

U.S. EPA ID Number
MAD039322250

7. Transporter 2 Company Name

U.S. EPA ID Number

8. Designated Facility Name and Site Address
Clean Harbors El Dorado LLC
309 American Circle
El Dorado, AR 71730
Facility's Phone: (870) 863-7173

U.S. EPA ID Number
ARD069748192

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes		
						D008	D028	D040
X	1. RQ, NA3077, HAZARDOUS WASTE, SOLID, N.O.S., (LEAD, TCE, 1,2-DICHLOROETHANE), 9, PG III (D008)	001	DM	0182	P			B
	2.							
	3.							
	4.							

14. Special Handling Instructions and Additional Information
1.CH475097 /X55 ERG#171

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: VAL DELA FUENTE, AFRPA/BPM
Signature: Val dela
Month: 11 Day: 30 Year: 11

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Walt St. Pierre
Signature:
Month: 11 Day: 30 Year: 11

Transporter 2 Printed/Typed Name
Signature
Month Day Year

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator)
U.S. EPA ID Number
Facility's Phone:

18c. Signature of Alternate Facility (or Generator)
Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.
H040			

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name
Signature
Month Day Year

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

Clean Harbors has the appropriate permits for and will accept the waste the generator is shipping.

Site Address : McPike Road
Rome, NY 13441

SC PPW 3/3/2011
WORK ORDER NO. 723729071

DOCUMENT NO. 402414

STRAIGHT BILL OF LADING

TRANSPORTER 1 Clean Harbors Environmental Services Inc VEHICLE ID #

EPA ID # MAD039322250 TRANS. 1 PHONE (781)792-5000

TRANSPORTER 2 VEHICLE ID #

EPA ID # TRANS. 2 PHONE

DESIGNATED FACILITY			SHIPPER		
Clean Harbors Chattanooga LLC			AFRPA AFCEE EXC-Griffiss		
FACILITY EPA ID # TND982141392			SHIPPER EPA ID # NY4571924451		
ADDRESS 3300 Cummings Road			ADDRESS 428 Phoenix Drive		
CITY Chattanooga	STATE TN	ZIP 37419	CITY Rome	STATE NY	ZIP 13441

CONTAINERS NO. & SIZE	TYPE	HM	DESCRIPTION OF MATERIALS	TOTAL QUANTITY	UNIT WT/VOL
1X55	DM		A. NON DOT REGULATED MATERIAL, (PETROLEUM OIL AND WATER)	300	P
			B.		
			C.		
			D.		
			E.		
			F.		
			G.		
			H.		

SPECIAL HANDLING INSTRUCTIONS EMERGENCY PHONE #: (800) 483-3718 GENERATOR: AFRPA AFCEE EXC-Griffiss
A.CH476350

SHIPPERS CERTIFICATION: This is to certify that the above named materials are properly classified, described, packaged, marked and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

SHIPPER	PRINT CATHERINE JERRARD	SIGN	DATE 11/30/11
TRANSPORTER 1	PRINT W+H St. Pierre	SIGN	DATE 11-30-11
TRANSPORTER 2	PRINT	SIGN	DATE
RECEIVED BY	PRINT	SIGN	DATE

CHI 107

D

Daily Activity Forms

Daily Activity Summary

Date: Tuesday, May 17, 2011 | Report No.: 1

Project Name: AOC 9 Baseline, Performance, and Long-Term Monitoring, Former Griffiss AFB | Weather: Cloudy with periods of drizzle, 53°F(AM), 62°F(PM)

Personnel	Hrs.	Affiliation	Personnel	Hrs.	Affiliation
M. Horanburg	12	EEEPC			
J. Mays	12	EEEPC			

Summary of Activities

Equipment	AOC/Task	Activities Performed
Heron water level indicator	water levels	- measure depth to water in wells
Mini RAE (PID)	Purge and	-screen wells as opened, screen purged water
YSI	sample gw	-measure pH, cond., temp., DO, ORP of gw and sfc water
LaMotte	from monitoring	- measure turbidity of gw and sfc water
GeoControl Pro	wells; sample	- control flow rate of bladder pump
	sfc water	

Figure 3-5 Daily Activity Summary Form

Daily Activity Summary	
Date: Tuesday, May 17, 2011	Report No.: 1
Project Name: AOC 9 Baseline, Performance, and Long-Term Monitoring, Former Griffiss AFB	Weather: Cloudy with periods of drizzle, 53°F(AM), 62°F(PM)

Field Tests Performed (Sampling, Field Screening, Chemical Testing, etc.)

Screened wells with PID. Screened purged water with PID. Measured pH, temp, cond., DO, ORP, and turbidity of purge water, gw samples, and sfc water samples. Sampled MW06, MW17, MW15, MW14, SW01, SW02, and SW03. Measure water levels in permanent wells.

Work Delays (Due to Weather, Maintenance, Breakdowns, Waiting for Decisions)

Approximately 15 min. delay when began to purge MW15 due to air in lines. Adjusted/checked connections to fix.

Problems Encountered and Deviations From Work Plan

None

Written and Verbal Instruction by the Government

~~None~~ MM 5/17/11 Written instruction to take water levels only at permanent wells was provided prior to the field event.

Safety Issues

None

Planned Activities for Next Work Day

Purge and sample MW19. Ship samples to lab.

Remarks: (Visitors, Completion of Field Work at an AOC, etc.)

Completed purging and sampling at 4 wells.
Completed sampling at all 3 sfc water locations.
Water levels completed (prior to all other sampling).

Site Manager MMAdranberg	Date 5/17/11

Figure 3-5 Daily Activity Summary Form

Daily Activity Summary

Date: Wednesday, May 18, 2011	Report No.: 2
Project Name: AOC 9 Baseline, Performance, and Long-Term Monitoring, Former Griffiss AFB	Weather: Cloudy, 59°F, windy

Personnel	Hrs.	Affiliation	Personnel	Hrs.	Affiliation
M. Horanburg	6.5	EEEPC			
J. Mays	6.5	EEEPC			

Summary of Activities

Equipment	AOC/Task	Activities Performed
Heron water level indicator	measure water level in well, purge and sample gw in monitoring well	- measure depth to water in well - screen well as opened; screen purge water - measure pH, cond., temp., DO, ORP of gw - measure turbidity of gw - control flow rate of bladder pump
Mini RAE (PID)		
YSI		
La Motte		
GeoControl Pro		

Figure 3-5 Daily Activity Summary Form

Daily Activity Summary	
Date: Wednesday, May 18, 2011	Report No.: 2
Project Name: AOC 9 Baseline, Performance, and Long-Term Monitoring, Former Griffiss AFB	Weather: Cloudy, 59°F, windy
Field Tests Performed (Sampling, Field Screening, Chemical Testing, etc.)	
Screened well with PID. Screened purged water with PID. Measure pH, temp, cond., DO, ORP and turbidity of purged water and gw sample. Sampled MW19.	
Work Delays (Due to Weather, Maintenance, Breakdowns, Waiting for Decisions)	
None	
Problems Encountered and Deviations From Work Plan	
None	
Written and Verbal Instruction by the Government	
None.	
Safety Issues	
None	
Planned Activities for Next Work Day	
None	
Remarks: (Visitors, Completion of Field Work at an AOC, etc.)	
All sampling completed. Samples shipped via FedEx to Katahdin Analytical Services.	
Site Manager: M Hamburg	Date: 5/18/11

Figure 3-5 Daily Activity Summary Form

Page 2 of 2

Daily Activity Summary

Date: Monday, October 24, 2011 | Report No.: 001

Project Name: AOC 9 Baseline, Performance, and Long-Term Monitoring, Former Griffiss AFB | Weather: Partly cloudy with some sun, 54°F, rain in afternoon

Personnel	Hrs.	Affiliation	Personnel	Hrs.	Affiliation
M. Horanburg	12	EEEPC			
L Roedl	12	EEEPC			

Summary of Activities

Equipment	AOC/Task	Activities Performed
Water level indicator	water levels, surface water sampling, ground-water sampling of monitoring wells (1)	-measure water levels in perm. wells and depth to water while purging -screen wells upon opening, screen purged water - measure pH, temp, conductivity, DO, and ORP of surface and groundwater samples and purge water - measure turbidity of surface and groundwater - control flowrate of bladderpump
PID - MiniRAE		
Horiba 22		
La Motte		
GeoControl		

Figure 3-5 Daily Activity Summary Form

Daily Activity Summary	
Date: Monday, 10/24/11	Report No.: 001
Project Name: AOC 9 Baseline, Performance, and Long-Term Monitoring, Former Griffiss AFB	Weather: See page 1

Field Tests Performed (Sampling, Field Screening, Chemical Testing, etc.)

Screened wells and purge water with PID. Sampled MW19. Sampled surface water locations (SW01, SW02, SW03). Measured pH, temp, conductivity, turbidity, and ORP of surface water samples. Measured same parameter plus DO of groundwater.

Work Delays (Due to Weather, Maintenance, Breakdowns, Waiting for Decisions)

None.

Problems Encountered and Deviations From Work Plan

No calibration solutions were sent with the Horiba 22. Call placed to rental company, confirmed calibration in shop; supplied calibration certificate and overnighting solutions.

Written and Verbal Instruction by the Government

None.

Safety Issues

Potential afternoon thunderstorms.

Planned Activities for Next Work Day

Complete groundwater sampling at MW06, MW14, MW15, and MW17.

Remarks: (Visitors, Completion of Field Work at an AOC, etc.)

Surface water sampling and water levels completed.

Site Manager	Date
[signature]	10/24/11

Figure 3-5 Daily Activity Summary Form

Daily Activity Summary

Date: Tuesday, October 25, 2011	Report No.: 002
Project Name: AOC 9 Baseline, Performance, and Long-Term Monitoring, Former Griffiss AFB	Weather: Mostly cloudy, expected high winds, 46° F

Personnel	Hrs.	Affiliation	Personnel	Hrs.	Affiliation
M. Horanburg	12	EEEPC			
L. Roedl	12	EEEPC			
A. Darpinian	6.5	USACE			
I. Bowen	10.25	USACE			

Summary of Activities

Equipment	AOC/Task	Activities Performed
Water level indicator	Purge and sample ground-water from monitoring wells (4)	-measure water levels and depth to water while purging -screen wells upon opening and screen purged water -measure pH, temp, conductivity, DO, and ORP of groundwater -measure turbidity of groundwater -control flow rate of bladder pump.
PID - MiniRAE		
Horiba 22		
La Motte		
GeoControl		

Figure 3-5 Daily Activity Summary Form

Page 1 of 2

Daily Activity Summary

Date: Tuesday, 10/25/11	Report No.: 002
Project Name: AOC 9 Baseline, Performance, and Long-Term Monitoring, Former Griffiss AFB	Weather: see page 1

Field Tests Performed (Sampling, Field Screening, Chemical Testing, etc.)

Screened wells and purge water with PID. Measured pH, temp, conductivity, turbidity, DO, and ORP of groundwater. Sampled MW06, MW14, MW15, and MW17.

Work Delays (Due to Weather, Maintenance, Breakdowns, Waiting for Decisions)

Two delays due to same issue at MW15 and MW17. Bladder pumps were found to not be working after trouble shooting for possible problems. Approx. 50 min. delay at MW15 and approx. 50 min. delay at MW17.

Problems Encountered and Deviations From Work Plan

Due to above delays a small back up bladder pump was used to purge MW15 and MW17. MW17 was purged/sampled prior to MW15, so prior to the use of pump at MW15 it was decon'ed with alconox and DI water. A rinsate blank was also collected.

Written and Verbal Instruction by the Government

Verbal acknowledgement by USACE to use smaller back up bladder pump for both MW15 and MW17.

Safety Issues

High winds.

Planned Activities for Next Work Day

None.

Remarks: (Visitors, Completion of Field Work at an AOC, etc.)

All sampling complete. Samples shipped via FedEx to Katahdin Lab. The bladder pumps from MW15 and MW17 were removed and they will be checked to see if can repair or will need to replace. At this time, no pump in MW17 and back up pump in MW15.

Site Manager [signature]	Date 10/25/11

Figure 3-5 Daily Activity Summary Form

E Sampling Forms

1 well vol = 1.17

3 well vol. = 3.52

Groundwater Sampling Form

Project: AOC 9 Baseline (Performance) Long-Term Monitoring
Site: AOC 9-Former Griffiss Air Force Base
Well No.: AOC9-MW06
Sample Date: 5/17/2011
Sampling Device: QED T1200 bladder pump
Well Depth (feet TOIC): 14.2'
Screen Interval (feet BGS): 4.2-14.2'
Casing Inner Diameter (inches): 2.0
Initial PID Reading (ppm): 0.0

Sample ID: AOC9-MW06PM05172011
Sample Time: 1203
Sample Tubing: QED Teflon-lined polyethylene
Sample Turbidity (NTUs): 15.3
Initial Water Level (Feet TOIC): 7.00
Final Water Level (feet TOIC): 6.72
Casing Type: PVC

Time	pH	Temperature (°C)	Conductivity (µs/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Water Level (ft TOIC)	Flow Rate (LPM)	Comments
1116	4.51	8.24	0.342	77.4	5.97	248.0	7.00	500 mL/min	initial/surge w/set-up
1122	4.71	8.04	0.342	30.6	4.21	229.9	7.03	"	
1127	5.40	7.98	0.340	18.4	3.62	188.9	7.08	"	adjust to 250 mL/min
1132	6.05	8.49	0.340	11.6	3.38	153.7	6.75	250 mL/min	
1137	6.42	8.53	0.341	6.36	3.31	133.6	6.75	"	
1142	6.71	8.54	0.342	5.47	3.24	118.5	6.75	"	
1147	6.82	8.57	0.343	4.54	3.20	112.5	6.74	"	
1152	6.92	8.59	0.343	4.10	3.17	107.0	6.74	"	
1157	7.02	8.70	0.343	3.87	3.12	99.7	6.72	"	
								250 mL/min	sample flow rate

Photo taken 5/17/2011

Key:
°C = Degrees centigrade.
BGS = Below ground surface.
DO = Dissolved oxygen.
LPM = Liters per minute.
mg/L = Milligrams per liter.
mS/cm = microSiemens per centimeter.
NTU = Nephelometric turbidity unit.
NTU = Nephelometric turbidity unit.
ORP = Redox potential.
ppm = Parts per million.
PVC = Polyvinyl chloride.
TOIC = Top of inner (PVC) casing.

Figure 3-4 Groundwater Sampling Form

1 well vol. = 1.61

3 x well vol. = 4.8

Groundwater Sampling Form

Project: AOC 9 Baseline, Performance, Long-Term Monitoring
Site: AOC 9-Former Griffiss Air Force Base
Well No.: AOC9 - MW17
Sample Date: 5/17/11
Sampling Device: QED T1200 bladder pump
Well Depth (feet TOIC): 14.0'
Screen Interval (feet BGS): 9-14'
Casing Inner Diameter (inches): 2.0
Initial PID Reading (ppm): 0.0

Sample ID: AOC9-MW17PM05172011 + duplicate AOC9-MW17DPM05172011
Sample Time: 1416
Sample Tubing: QED Teflon-lined polyethylene
Sample Turbidity (NTUs): 10.25
Initial Water Level (Feet TOIC): 4.10
Final Water Level (feet TOIC): 3.91
Casing Type: PVC

Time	pH	Temperature (°C)	Conductivity (µs/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Water Level (ft TOIC)	Flow Rate (LPM)	Comments
1315	7.28	9.18	0.341	11.7	5.47	-3.5	4.10	>500mL/min	adjust upon initial surge
1320	5.70	9.14	0.336	6.26	1.55	50.3	4.24	<100mL/min	adjust to 250mL/min
1325	5.74	9.50	0.334	2.16	0.61	13.9	4.05	250mL/min	
1330	6.38	9.52	0.335	4.88	0.49	-33.5	4.05	"	
1335	6.71	9.40	0.338	7.58	0.43	-58.8	3.95	"	
1340	7.00	9.49	0.342	12.9	0.39	-81.3	3.95	"	
1345	7.10	9.47	0.349	17.2	0.36	-92.6	3.92	"	
1350	7.19	9.63	0.356	13.0	0.34	-103.7	3.92	"	
1355	7.26	9.61	0.363	10.9	0.31	-111.6	3.91	"	
1400	7.23	9.51	0.368	14.5	0.30	-114.4	3.91	"	
1405	7.21	9.40	0.371	12.5	0.28	-116.5	3.91	"	
1410	7.21	9.39	0.374	11.5	0.27	-119.5	3.91	"	
								sample flow rate = 250 mL/min	

MM Hoenbuss 5/17/11

Key:
°C = Degrees centigrade.
BGS = Below ground surface.
DO = Dissolved oxygen.
LPM = Liters per minute.
mg/L = Milligrams per liter.
mS/cm = microSiemens per centimeter.
NTU = Nephelometric turbidity unit.
NTU = Nephelometric turbidity unit.
ORP = Redox potential.
ppm = Parts per million.
PVC = Polyvinyl chloride.
TOIC = Top of inner (PVC) casing.

Figure 3-4 Groundwater Sampling Form

1 well vol. = 1.9
x 3 vol. = 5.7

Groundwater Sampling Form

Project: AOC 9 Baseline, Performance, Long-Term Monitoring
Site: AOC 9-Former Griffiss Air Force Base
Well No.: AOC9-MW15
Sample Date: 5/17/11
Sampling Device: QED T1200 bladder pump
Well Depth (feet TOIC): 14.0'
Screen Interval (feet BGS): 9-14'
Casing Inner Diameter (inches): 2.0
Initial PID Reading (ppm): 0.0

Sample ID: AOC9-MW15PM05172011
Sample Time: 1625
Sample Tubing: QED Teflon-lined polyethylene
Sample Turbidity (NTUs): 9.61
Initial Water Level (Feet TOIC): 2.43
Final Water Level (feet TOIC): 2.53
Casing Type: PVC

Time	pH	Temperature (°C)	Conductivity (µs/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Water Level (ft TOIC)	Flow Rate (LPM)	Comments
1530	7.03	9.99	0.502	17.5	5.17	-112.7	2.57	350mL/min	initial surge due to air bubbles
1535	7.04	10.54	0.539	12.4	0.77	-132.0	2.53	"	
1540	7.13	10.51	0.540	10.90	0.58	-139.6	2.53	"	
1545	7.13	10.46	0.540	6.25	0.54	-140.7	2.52	"	
1550	7.13	10.37	0.541	4.39	0.49	-142.5	2.53	"	
1555	7.14	10.33	0.540	4.01	0.49	-143.0	2.52	"	
1600	7.15	10.33	0.541	3.08	0.45	-144.9	2.52	"	
1605	7.15	10.27	0.540	2.23	0.44	-145.3	2.52	"	
1610	7.15	10.30	0.541	2.26	0.42	-146.1	2.52	"	
1615	7.16	10.27	0.541	1.97	0.42	-146.9	2.52	"	
								200mL/min = sample flow rate	

M. Fleming 5/17/11

Key:
°C = Degrees centigrade.
BGS = Below ground surface.
DO = Dissolved oxygen.
LPM = Liters per minute.
mg/L = Milligrams per liter.
mS/cm = microSiemens per centimeter.
NTU = Nephelometric turbidity unit.
NTU = Nephelometric turbidity unit.
ORP = Redox potential.
ppm = Parts per million.
PVC = Polyvinyl chloride.
TOIC = Top of inner (PVC) casing.

Figure 3-4 Groundwater Sampling Form

1 well vol. = 1.78

x 3 vol. = 5.3

Groundwater Sampling Form

Project: AOC 9 Baseline / Performance / Long-Term Monitoring
Site: AOC 9-Former Griffiss Air Force Base
Well No.: AOC9-MW14
Sample Date: 5/17/11
Sampling Device: QED T1200 bladder pump
Well Depth (feet TOIC): 24.0'
Screen Interval (feet BGS): 14-24'
Casing Inner Diameter (inches): 2.0
Initial PID Reading (ppm): 0.0

Sample ID: AOC9-MW14PM051720111 & MS/MSD
Sample Time: 1832
Sample Tubing: QED Teflon-lined polyethylene
Sample Turbidity (NTUs): 2.01
Initial Water Level (Feet TOIC): 13.10
Final Water Level (feet TOIC): 13.15
Casing Type: PVC

Time	pH	Temperature (°C)	Conductivity (µs/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Water Level (ft TOIC)	Flow Rate (LPM)	Comments
1730	6.13	8.18	0.426	62.8	2.36	-20.5	13.10	>500mL/min	initial surge-adjust flowrate
1740	5.58	8.58	0.440	58.6	0.89	-26.7	13.13	250mL/min	
1745	6.34	8.84	0.458	17.9	0.47	-88.7	13.13	"	
1750	6.56	8.91	0.460	11.2	0.46	-105.2	13.19	"	
1755	6.73	8.79	0.457	7.50	0.39	-118.6	13.12	"	
1800	6.83	8.76	0.458	5.86	0.38	-127.0	13.12	"	
1805	7.04	8.80	0.453	6.77	0.42	-135.1	13.12	< 100mL/min	battery on pump starts to die
1810	6.82	8.08	0.450	5.95	0.54	-119.9	13.15	400mL/min	new flow rate when attached to car
1815	6.87	8.05	0.459	4.06	0.32	-131.2	13.15	"	
1820	6.92	8.01	0.458	3.41	0.29	-136.7	13.15	"	
1825	6.95	8.04	0.457	3.50	0.31	-140.1	13.15	"	
								250mL/min = sample flow rate	

MK Hamburg 5/17/11

Key:
°C = Degrees centigrade.
BGS = Below ground surface.
DO = Dissolved oxygen.
LPM = Liters per minute.
mg/L = Milligrams per liter.
mS/cm = microSiemens per centimeter.
NTU = Nephelometric turbidity unit.
NTU = Nephelometric turbidity unit.
ORP = Redox potential.
ppm = Parts per million.
PVC = Polyvinyl chloride.
TOIC = Top of inner (PVC) casing.

Figure 3-4 Groundwater Sampling Form

1 well vol. = 1.83

x3 vol = 5.49

Groundwater Sampling Form

Project: AOC 9 Baseline (Performance) Long-Term Monitoring
Site: AOC 9-Former Griffiss Air Force Base
Well No.: AOC9-MW19
Sample Date: 5/18/11
Sampling Device: QED T1200 bladder pump
Well Depth (feet TOIC): 19.0'
Screen Interval (feet BGS): 9-19'
Casing Inner Diameter (inches): 2.0
Initial PID Reading (ppm): 0.1

Sample ID: AOC9-MW19PM05182011
Sample Time: 1325
Sample Tubing: QED Teflon-lined polyethylene
Sample Turbidity (NTUs): 44.7
Initial Water Level (Feet TOIC): 7.80
Final Water Level (feet TOIC): 7.76
Casing Type: PVC

Time	pH	Temperature (°C)	Conductivity (µs/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Water Level (ft TOIC)	Flow Rate (LPM)	Comments
0915	6.49	8.59	0.996	>1000	6.06	104.6	7.80	450mL/min	
0920	5.65	8.88	0.866	>1000	5.52	136.6	7.75	"	
0925	5.91	8.70	0.763	>1000	6.48	119.5	7.76	"	
0930	6.44	8.59	0.703	>1000	8.74	92.2	7.74	"	
0940	6.78	8.66	0.661	>1000	7.71	71.9	7.75	"	
0945	6.91	8.80	0.644	>1000	7.89	65.1	7.74	"	
0950	6.99	8.76	0.636	964	7.96	61.0	7.74	"	
0955	7.06	8.81	0.632	797	8.00	58.1	7.74	"	
1000	7.11	8.87	0.628	631	8.03	55.6	7.74	"	
1005	7.13	8.82	0.626	524	8.07	54.8	7.75	"	
1010	7.15	8.69	0.611	472	8.24	54.3	7.75	"	
1015	7.18	8.78	0.611	408	8.17	50.7	7.74	"	
1020	7.18	8.55	0.605	364	8.29	52.7	7.74	"	
1025	7.20	8.69	0.594	330	8.36	52.7	7.74	"	
1030	7.22	8.72	0.593	291	8.37	51.9	7.75	"	
1035	7.22	8.65	0.588	259	8.37	52.7	7.75	"	
1040	7.23	8.56	0.588	218	8.44	53.4	7.74	"	
1045	7.23	8.51	0.584	214	8.42	52.8	7.74	"	
1050	7.25	8.47	0.582	211	8.39	53.4	7.74	"	

Key:
°C = Degrees centigrade.
BGS = Below ground surface.
DO = Dissolved oxygen.
LPM = Liters per minute.
mg/L = Milligrams per liter.
mS/cm = microSiemens per centimeter.
NTU = Nephelometric turbidity unit.
NTU = Nephelometric turbidity unit.
ORP = Redox potential.
ppm = Parts per million.
PVC = Polyvinyl chloride.
TOIC = Top of inner (PVC) casing.

Figure 3-4 Groundwater Sampling Form

Groundwater Sampling Form

Well No.: AOC9-MW19 Date: 5/18/11

Time	pH	Temperature (°C)	Conductivity (µs/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Water Level (ft TOIC)	Flow Rate (LPM)	Comments
1055	7.23	8.46	0.579	197	8.42	54.0	7.74	"	
1100	7.25	8.40	0.571	180	8.53	54.0	7.74	"	
1105	7.25	8.44	0.571	176	8.52	53.8	7.74	"	
1110	7.26	8.42	0.571	174	8.51	53.4	7.74	"	
1115	7.11	8.43	0.570	150	8.55	63.4	7.74	"	
1120	7.18	8.46	0.568	130	8.45	59.3	7.74	"	
1125	7.20	8.44	0.565	116	8.53	59.2	7.74	"	
1130	7.22	8.42	0.560	110	8.58	59.1	7.74	"	
1140	7.23	8.43	0.561	106	8.56	59.9	7.74	"	
1145	7.25	8.52	0.560	93.1	8.54	57.6	7.74	"	
1150	7.26	8.56	0.558	82.1	8.60	57.9	7.74	"	
1155	7.28	8.50	0.555	80.6	8.60	55.9	7.74	"	
1200	7.22	8.60	0.555	78.6	8.55	64.9	7.74	"	
1205	7.16	8.70	0.553	71.8	8.57	64.9	7.75	"	
1210	7.21	8.63	0.552	68.7	8.59	61.3	7.75	"	
1215	7.22	8.61	0.551	67.8	8.57	59.9	7.75	"	
1220	7.22	8.60	0.553	71.0	8.55	58.1	7.75	"	
1225	7.26	8.43	0.554	90.3	8.45	57.3	7.75	600mL/min	adjust tobing backdown
1230	7.28	9.34	0.558	83.1	8.46	57.9	7.75	250 mL/min	
1235	7.30	10.05	0.568	53.4	8.14	57.1	7.75	"	
1240	7.30	10.25	0.572	55.4	8.07	54.3	7.75	"	
1245	7.31	10.31	0.568	52.6	8.06	54.5	7.75	"	
1250	7.31	10.46	0.570	49.2	8.00	55.5	7.75	"	
1255	7.30	10.51	0.582	51.3	7.78	56.5	7.75	"	

Key:

°C = Degrees centigrade.
BGS = Below ground surface.
DO = Dissolved Oxygen
LPM = Liters per minute
mg/L = Milligrams per liter
mS/cm = microSiemens per centimeter
NTU = Nephelometric turbidity unit.
NTU = Nephelometric turbidity unit.
ORP = Redox potential
ppm = Parts per million.
PVC = Polyvinyl chloride.
TOIC = Top of inner (PVC) casing.

Figure 3-4 Groundwater Sampling Form

Groundwater Sampling Form

Project: AOC 9 Baseline/Performance/Long-Term Monitoring
Site: AOC 9-Former Griffiss Air Force Base
Well No.: AOC9-MW19
Sample Date: 5/10/11
Sampling Device: QED T1200 bladder pump
Well Depth (feet TOIC): 19.0'
Screen Interval (feet BGS): 9-19'
Casing Inner Diameter (inches): 2.0
Initial PID Reading (ppm): 0.1

Sample ID: AOC9-MW19PM05182011
Sample Time: 1325
Sample Tubing: QED Teflon-lined polyethylene
Sample Turbidity (NTUs): 44.7
Initial Water Level (Feet TOIC): 7.80
Final Water Level (feet TOIC): 7.75
Casing Type: PVC

Time	pH	Temperature (°C)	Conductivity (µs/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Water Level (ft TOIC)	Flow Rate (LPM)	Comments
1300	7.31	10.52	0.577	50.1	7.86	54.2	7.75	"	
1305	7.33	10.42	0.578	58.5	7.86	56.2	7.75	"	
1310	7.31	10.54	0.574	44.7	7.86	54.6	7.75	"	
1315	7.32	10.43	0.575	44.9	7.93	54.5	7.75	"	
1320	7.30	10.39	0.575	45.7	7.85	55.5	7.75	"	
								225mL/min	sample flow rate

M Moran 5/18/11

Key:
°C = Degrees centigrade.
BGS = Below ground surface.
DO = Dissolved oxygen.
LPM = Liters per minute.
mg/L = Milligrams per liter.
mS/cm = microSiemens per centimeter.
NTU = Nephelometric turbidity unit.
NTU = Nephelometric turbidity unit.
ORP = Redox potential.
ppm = Parts per million.
PVC = Polyvinyl chloride.
TOIC = Top of inner (PVC) casing.

Figure 3-4 Groundwater Sampling Form

SURFACE
~~Groundwater~~ Sampling Form

Project: AOC 9 Baseline, Performance, Long-Term Monitoring
Site: AOC 9-Former Griffiss Air Force Base
Well No.: NA
Sample Date: 5/17/11
Sampling Device: ~~QED TI200 bladder pump~~ Clean jar by hand
Well Depth (feet TOIC): NA
Screen Interval (feet BGS): NA
Casing Inner Diameter (inches): NA
Initial PID Reading (ppm): NA

Sample ID: AOC9-SW01PM05172011
Sample Time: 1435
Sample Tubing: ~~QED Teflon-lined polyethylene~~ NA
Sample Turbidity (NTUs): 1.99
Initial Water Level (Feet TOIC): NA
Final Water Level (feet TOIC): NA
Casing Type: ~~PVC~~ NA

Time	pH	Temperature (°C)	Conductivity (µs/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Water Level (ft TOIC)	Flow Rate (LPM)	Comments
1435	7.70	16.54	0.175	1.99	8.96	-43.9	NA	NA	

No drawdown 5/17/11

Key:
°C = Degrees centigrade.
BGS = Below ground surface.
DO = Dissolved oxygen.
LPM = Liters per minute.
mg/L = Milligrams per liter.
mS/cm = microSiemens per centimeter.
NTU = Nephelometric turbidity unit.
NTU = Nephelometric turbidity unit.
ORP = Redox potential.
ppm = Parts per million.
PVC = Polyvinyl chloride.
TOIC = Top of inner (PVC) casing.

Figure 3-4 ~~Groundwater~~ SURFACE Sampling Form

*note 1 vial has bubbles - could not get out

SURFACE
~~Groundwater~~ Sampling Form

Project: AOC 9 Baseline, (Performance) Long-Term Monitoring
Site: AOC 9-Former Griffiss Air Force Base
Well No.: NA
Sample Date: 5/17/11
Sampling Device: ~~QED T1200 bladder pump~~ clean jar by hand
Well Depth (feet TOIC): NA
Screen Interval (feet BGS): NA
Casing Inner Diameter (inches): NA
Initial PID Reading (ppm): NA

Sample ID: AOC9-SW02PM05172011
Sample Time: 1426
Sample Tubing: ~~QED Teflon-lined polyethylene~~ NA
Sample Turbidity (NTUs): 3.54
Initial Water Level (Feet TOIC): NA
Final Water Level (feet TOIC): NA
Casing Type: ~~PVC~~ NA

Time	pH	Temperature (°C)	Conductivity (µs/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Water Level (ft TOIC)	Flow Rate (LPM)	Comments
1426	7.99	16.87	0.179	3.54	8.71	-52.4	NA	NA	

Key:
°C = Degrees centigrade.
BGS = Below ground surface.
DO = Dissolved oxygen.
LPM = Liters per minute.
mg/L = Milligrams per liter.
mS/cm = microSiemens per centimeter.
NTU = Nephelometric turbidity unit.
NTU = Nephelometric turbidity unit.
ORP = Redox potential.
ppm = Parts per million.
PVC = Polyvinyl chloride.
TOIC = Top of inner (PVC) casing.

Figure 3-4 ~~Groundwater~~ SURFACE Sampling Form

SURFACE
~~Groundwater~~ Sampling Form

Project: AOC 9 Baseline, (Performance,) Long-Term Monitoring
Site: AOC 9-Former Griffiss Air Force Base
Well No.: NA
Sample Date: 05/17/11
Sampling Device: ~~QED T1200 bladder pump~~ clean jar by hand
Well Depth (feet TOIC): NA
Screen Interval (feet BGS): NA
Casing Inner Diameter (inches): NA
Initial PID Reading (ppm): NA

Sample ID: AOC9-SW03PM05172011
Sample Time: 1235
Sample Tubing: ~~QED Teflon-lined polyethylene~~ NA
Sample Turbidity (NTUs): 5.07
Initial Water Level (Feet TOIC): NA
Final Water Level (feet TOIC): NA
Casing Type: ~~PVC~~ NA

Time	pH	Temperature (°C)	Conductivity (µs/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Water Level (ft TOIC)	Flow Rate (LPM)	Comments
1235	6.69	16.32	0.213	5.07	8.81	118.1	NA	NA	

Monitoring 5/17/11

Key:
°C = Degrees centigrade.
BGS = Below ground surface.
DO = Dissolved oxygen.
LPM = Liters per minute.
mg/L = Milligrams per liter.
mS/cm = microSiemens per centimeter.
NTU = Nephelometric turbidity unit.
NTU = Nephelometric turbidity unit.
ORP = Redox potential.
ppm = Parts per million.
PVC = Polyvinyl chloride.
TOIC = Top of inner (PVC) casing.

Figure 3-4 ~~Groundwater~~ SURFACE Sampling Form

Groundwater Sampling Form

Project: AOC 9 Baseline/Performance/ Long Term Monitoring
Site: AOC 9-Former Griffiss Air Force Base
Well No.: AOC9 - MW06
Sample Date: 10/25/11
Sampling Device: QED T1200 bladder pump
Well Depth (feet TOIC): 14.2
Screen Interval (feet BGS): 4.2 - 14.2
Casing Inner Diameter (inches): 2.0
Initial PID Reading (ppm): 0.0

Sample ID: AOC9 - MW06PM10252011
Sample Time: 1256
Sample Tubing: QED teflon-lined polyethylene
Sample Turbidity (NTUs): 2.04
Initial Water Level (Feet TOIC): 6.45
Final Water Level (feet TOIC): 6.85
Casing Type: PVC

Time	pH	Temperature (°C)	Conductivity (mS/cm) ~~(µs/cm)~~	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Water Level (ft TOIC)	Flow Rate (mL/min) ~~(LPM)~~	Purge Volume (gallons)	Comments
1210	6.71	13.3	0.469	74.9	2.37	174	6.45	>500	0	trouble adjusting pump
1215	7.27	13.3	0.473	32.7	1.91	148	7.08	600	1.0	initially to get good
1220	7.32	13.3	0.472	15.5	1.95	144	7.01	500	1.0	flow rate.
1225	7.34	13.2	0.471	7.69	1.83	139	6.91	400	2.0	purge water = 0.0 ppm
1230	7.38	13.1	0.469	4.37	1.76	134	6.89	350	3.0	
1235	7.39	13.2	0.468	3.55	1.71	131	6.85	"	3.5	
1240	7.39	13.2	0.467	2.82	1.68	129	6.85	"	4.0	
1245	7.39	13.2	0.466	2.49	1.68	128	6.85	"	4.0	purge water = 0.0 ppm
1250	7.41	13.4	0.466	2.60	1.66	126	6.85	"	4.5	

MK Brandow 10/25/11

Key:
°C = Degrees centigrade.
BGS = Below ground surface.
DO = Dissolved Oxygen
LPM = Liters per minute
mg/L = Milligrams per liter
mS/cm = microSiemens per centimeter
NTU = Nephelometric turbidity unit.
NTU = Nephelometric turbidity unit.
ORP = Redox potential
ppm = Parts per million.
PVC = Polyvinyl chloride.
TOIC = Top of inner (PVC) casing.

Figure 3-4 Groundwater Sampling Form

1 well vol. = 1.26
x 3 = 3.8 gal

Groundwater Sampling Form

Project: AOC 9 Baseline, Performance, Long Term Monitoring
Site: AOC 9-Former Griffiss Air Force Base
Well No.: AOC9-MW14
Sample Date: 10/25/11
Sampling Device: QED T1200 bladder pump
Well Depth (feet TOIC): 24.0
Screen Interval (feet BGS): 14-24
Casing Inner Diameter (inches): 2.0
Initial PID Reading (ppm): 0.0

Sample ID: AOC9-MW14PM10252011 (MS/MSD collected)
Sample Time: 0950
Sample Tubing: QED teflon-lined polyethylene
Sample Turbidity (NTUs): 1.29
Initial Water Level (Feet TOIC): 14.19
Final Water Level (feet TOIC): 14.21
Casing Type: PVC

Time	pH	Temperature (°C)	Conductivity (~~µs/cm~~ mS/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Water Level (ft TOIC)	Flow Rate (~~LPM~~ mL/min)	Purge Volume (gallons)	Comments
0840	7.04	12.5	0.559	30.8	1.29	-59	14.19	~501	0	
0845	7.09	12.7	0.538	12.9	0.26	-136	14.21	450	1	
0850	7.11	12.8	0.529	5.79	0.17	-150	14.21	"	1.5	
0855	7.11	12.8	0.524	4.28	0.18	-153	14.20	"	2.0	
0900	7.12	12.8	0.517	3.43	0.16	-157	14.21	400	2.5	
0905	7.11	12.8	0.514	2.89	0.78	-159	14.21	"	3.0	
0910	7.12	12.8	0.511	2.41	1.10	-165	14.21	"	4.0	purge water = 0.0 ppm
0915	7.12	12.8	0.507	2.11	0.93	-163	14.21	"	4.5	
0920	7.11	12.8	0.505	1.93	0.78	-165	14.21	"	5.0	
0925	7.14	12.9	0.504	1.84	0.80	-165	14.21	"	5.5	
0930	7.14	12.8	0.501	1.58	0.67	-166	14.21	"	6.0	
0935	7.13	13.0	0.502	1.58	0.60	-167	14.21	"	6.5	
0940	7.13	12.9	0.503	1.69	0.64	-166	14.21	"	7.0	purge water = 0.0 ppm

Key:
°C = Degrees centigrade.
BGS = Below ground surface.
DO = Dissolved Oxygen
LPM = Liters per minute
mg/L = Milligrams per liter
mS/cm = microSiemens per centimeter
NTU = Nephelometric turbidity unit.
NTU = Nephelometric turbidity unit.
ORP = Redox potential
ppm = Parts per million.
PVC = Polyvinyl chloride.
TOIC = Top of inner (PVC) casing.

Figure 3-4 Groundwater Sampling Form

1 well = 1.6
X 3 = 4.8 gallons

Groundwater Sampling Form

Project: AOC 9 Baseline, Performance, Long Term Monitoring
Site: AOC 9-Former Griffiss Air Force Base
Well No.: AOC9-MW15
Sample Date: 10/25/11
Sampling Device: QED T1200 bladder pump
Well Depth (feet TOIC): 14.0
Screen Interval (feet BGS): 9-14
Casing Inner Diameter (inches): 2.0
Initial PID Reading (ppm): 0.0

Sample ID: AOC9-MW15PM10252011
Sample Time: 1802
Sample Tubing: QED teflon-lined polyethylene
Sample Turbidity (NTUs): 0.41
Initial Water Level (Feet TOIC): 2.90
Final Water Level (feet TOIC): 2.91
Casing Type: PVC

Time	pH	Temperature (°C)	Conductivity (mS/cm) (µs/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Water Level (ft TOIC)	Flow Rate (mL/min) (LPM)	Purge Volume (gallons)	Comments
~~1610~~										~~10/25/11~~
1700	7.10	12.7	0.726	3.27	8.73	-98	2.99	400	0	
1705	7.10	12.6	0.835	7.49	5.55	-140	2.94	400	1.5	
~~1710~~	7.10	12.6	0.829	3.99	4.25	-147	2.90	400	2.0	
1715	7.10	12.6	0.834	3.64	3.41	-151	2.90	400	2.0	
1720	7.11	12.6	0.832	1.51	2.75	-155	2.90	400	2.5	purge water = 0.0 ppm
1725	7.10	12.6	0.825	1.17	2.01	-158	2.90	"	3.0	
1730	7.10	12.5	0.830	1.39	1.59	-160	2.91	"	3.5	
1735	7.10	12.5	0.828	1.01	1.26	-162	2.91	400	3.5	
1740	7.10	12.5	0.827	0.55	0.96	-162	2.91	"	4.5	purge water = 0.0 ppm
1745	7.09	12.4	0.828	0.55	0.83	-164	2.91	"	5.0	
1750	7.10	12.4	0.827	0.36	0.78	-165	2.91	"	5.5	
1755	7.10	12.4	0.824	0.59	0.81	-164	2.91	"	6.0	purge water = 0.1 ppm

MM Duncan 10/25/11

Key:
°C = Degrees centigrade.
BGS = Below ground surface.
DO = Dissolved Oxygen
LPM = Liters per minute
mg/L = Milligrams per liter
mS/cm = microSiemens per centimeter
NTU = Nephelometric turbidity unit.
NTU = Nephelometric turbidity unit.
ORP = Redox potential
ppm = Parts per million.
PVC = Polyvinyl chloride.
TOIC = Top of inner (PVC) casing.

Figure 3-4 Groundwater Sampling Form

1 well vol. = 1.81
x 3 = 5.4 gallons

Groundwater Sampling Form

Project: AOC 9 Baseline, Performance, Long Term Monitoring
Site: AOC 9-Former Griffiss Air Force Base
Well No.: AOC9 - MW17
Sample Date: 10/25/11
Sampling Device: QED T1200 bladder pump
Well Depth (feet TOIC): 14.0
Screen Interval (feet BGS): 9-14
Casing Inner Diameter (inches): 2.0
Initial PID Reading (ppm): 0.0

Sample ID: AOC9 - MW17 PM10252011 / AOC9-MW17/DPM10252011
Sample Time: 1544
Sample Tubing: QED teflon-lined polyethylene
Sample Turbidity (NTUs): 1.44
Initial Water Level (Feet TOIC): ~~3.37 MH~~ 10/25/11 3.10
Final Water Level (feet TOIC): 3.50
Casing Type: PVC

Time	pH	Temperature (°C)	Conductivity (mS/cm) ~~(µs/cm)~~	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Water Level (ft TOIC)	Flow Rate (mL/min) ~~(LPM)~~	Purge Volume (gallons)	Comments
1435	7.47	12.9	0.512	71.0	9.78	-75	3.10	400	0	
1440	7.42	12.8	0.516	60.0	0.36	-130	4.15	400	1.0	
1445	7.41	12.8	0.521	59.9	0.23	-147	4.05	"	1.5	
1450	7.41	12.7	0.522	46.8	0.14	-161	4.10	"	2.0	
1455	7.40	12.7	0.522	25.9	0.10	-166	4.08	"	2.0	
1500	7.40	12.7	0.522	23.6	0.07	-170	4.08	"	2.5	
1505	7.39	12.7	0.525	15.2	0.05	-173	4.10	"	3.0	
1510	7.38	12.7	0.525	9.28	0.02	-175	4.10	350	4.0	purge water = 0.0ppm
1515	7.37	12.7	0.525	7.30	0.01	-176	4.05	"	4.0	
1520	7.44	12.8	0.531	4.83	0.01	-177	4.10	"	4.0	
1525	7.40	12.9	0.532	3.52	0.01	-177	4.10	"	5.0	
1530	7.38	12.8	0.533	2.37	0.01	-178	4.10	"	5.0	
1535	7.36	12.8	0.534	2.21	0.01	-178	4.10	"	6.0	purge water = 0.0ppm

~~MH 10/25/11~~

Key:
°C = Degrees centigrade.
BGS = Below ground surface.
DO = Dissolved Oxygen
LPM = Liters per minute
mg/L = Milligrams per liter
mS/cm = microSiemens per centimeter
NTU = Nephelometric turbidity unit.
NTU = Nephelometric turbidity unit.
ORP = Redox potential
ppm = Parts per million.
PVC = Polyvinyl chloride.
TOIC = Top of inner (PVC) casing.

Figure 3-4 Groundwater Sampling Form

1 well vol. = 1.78
x3 = 5.33

Page 1 of 1

Groundwater Sampling Form

Project: AOC 9 Baseline, Performance, Long Term Monitoring
Site: AOC 9-Former Griffiss Air Force Base
Well No.: AOC9-MW19
Sample Date: 10/24/11
Sampling Device: QED T1200 bladder pump
Well Depth (feet TOIC): 19.0
Screen Interval (feet BGS): 9-19
Casing Inner Diameter (inches): 2.0
Initial PID Reading (ppm): 0.0

Sample ID: AOC9-MW19PM102420111
Sample Time: 1743
Sample Tubing: QED teflon-lined polyethylene
Sample Turbidity (NTUs): 40.3
Initial Water Level (Feet TOIC): 9.13
Final Water Level (feet TOIC): 9.19
Casing Type: PVC

Time	pH	Temperature (°C)	Conductivity (~~µs/cm~~ mS/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Water Level (ft TOIC)	Flow Rate (~~LPM~~ mL/min)	Purge Volume (gallons)	Comments
1630	6.57	16.6	0.98	187	8.18	59	9.13	~900	0	
1635	6.91	16.4	0.664	192	7.82	95	9.27	500	2	
1640	6.87	16.4	0.639	155	7.72	101	9.26	500	2	
1645	6.94	16.4	0.607	123	7.30	110	9.20	"	3	
1650	6.96	16.4	0.610	117	7.09	109	9.20	"	3	
1655	7.00	16.4	0.583	94.4	8.73	110	9.19	450	4	
1700	7.01	16.4	0.586	83.5	8.27	109	9.19	"	4	
1705	7.03	16.4	0.579	71.8	7.87	109	9.19	"	5	purge water = 0 ppm
1710	7.05	16.4	0.568	66.0	7.64	110	9.19	"	6	
1715	7.07	16.4	0.560	54.8	7.36	110	9.19	"	6	
1720	7.09	16.4	0.553	50.7	7.12	112	9.19	"	7	
1725	7.11	16.4	0.540	49.1	6.92	113	9.19	"	8	
1730	7.12	16.3	0.540	44.8	6.80	114	9.19	"	8	
1735	7.13	16.4	0.537	45.5	6.16	114	9.19	"	9	purge water = 0 ppm

Key:
°C = Degrees centigrade.
BGS = Below ground surface.
DO = Dissolved Oxygen
LPM = Liters per minute
mg/L = Milligrams per liter
mS/cm = microSiemens per centimeter
NTU = Nephelometric turbidity unit.
NTU = Nephelometric turbidity unit.
ORP = Redox potential
ppm = Parts per million.
PVC = Polyvinyl chloride.
TOIC = Top of inner (PVC) casing.

Figure 3-4 Groundwater Sampling Form

1 well volume = 1.61
x 3 = 4.83

Page 1 of 1

Surface Water

~~Groundwater~~ Sampling Form

Project: AOC 9 Baseline, Performance, Long Term Monitoring
Site: AOC 9-Former Griffiss Air Force Base
Well No.: NA
Sample Date: 10/24/11
Sampling Device: ~~QED T1200 bladder pump~~ clean jar by hand
Well Depth (feet TOIC): NA
Screen Interval (feet BGS): NA
Casing Inner Diameter (inches): NA
Initial PID Reading (ppm): NA

Sample ID: AOC9-SW01PM10242011
Sample Time: 1525
Sample Tubing: ~~QED teflon-lined polyethylene~~ NA
Sample Turbidity (NTUs): 3.81
Initial Water Level (Feet TOIC): NA
Final Water Level (feet TOIC): NA
Casing Type: ~~PVC~~ NA

Time	pH	Temperature (°C)	Conductivity (µs/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Water Level (ft TOIC)	Flow Rate (LPM)	Purge Volume (gallons)	Comments
1525	7.21	12.9	0.410	3.81	NA	146	NA	NA	NA	—

CMA 10/24/11

Key:
°C = Degrees centigrade.
BGS = Below ground surface.
DO = Dissolved Oxygen
LPM = Liters per minute
mg/L = Milligrams per liter
mS/cm = microSiemens per centimeter
NTU = Nephelometric turbidity unit.
NTU = Nephelometric turbidity unit.
ORP = Redox potential
ppm = Parts per million.
PVC = Polyvinyl chloride.
TOIC = Top of inner (PVC) casing.

Figure 3-4 ~~Groundwater~~ Sampling Form
Surface Water

Page 1 of 1

~~Surface Water~~

~~Groundwater~~ Sampling Form

Project: AOC 9 Baseline, Performance, Long Term Monitoring
Site: AOC 9-Former Griffiss Air Force Base
Well No.: NA
Sample Date: 10/24/11
Sampling Device: ~~QED T1200 bladder pump~~ clean jar by hand
Well Depth (feet TOIC): NA
Screen Interval (feet BGS): NA
Casing Inner Diameter (inches): NA
Initial PID Reading (ppm): NA

Sample ID: AOC9-SW02PM102420 11
Sample Time: 1506
Sample Tubing: ~~QED teflon-lined polyethylene~~ NA
Sample Turbidity (NTUs): 5.54
Initial Water Level (Feet TOIC): NA
Final Water Level (feet TOIC): NA
Casing Type: ~~PVC~~ NA

Time	pH	Temperature (°C)	Conductivity (µs/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Water Level (ft TOIC)	Flow Rate (LPM)	Purge Volume (gallons)	Comments
1506	7.00	11.8	0.281	5.54	NA	155	NA	NA	NA	—

NA Sampling 10/24/11

Key:
°C = Degrees centigrade.
BGS = Below ground surface.
DO = Dissolved Oxygen
LPM = Liters per minute
mg/L = Milligrams per liter
mS/cm = microSiemens per centimeter
NTU = Nephelometric turbidity unit.
NTU = Nephelometric turbidity unit.
ORP = Redox potential
ppm = Parts per million.
PVC = Polyvinyl chloride.
TOIC = Top of inner (PVC) casing.

Figure 3-4 ~~Groundwater~~ Sampling Form
Surface Water

Page 1 of 1

~~Surface Water~~

~~Groundwater~~ Sampling Form

Project: AOC 9 Baseline, Performance, Long Term Monitoring
Site: AOC 9-Former Griffiss Air Force Base
Well No.: NA
Sample Date: 10/24/11
Sampling Device: ~~QED T1200 bladder pump~~ Clean jar by hand
Well Depth (feet TOIC): NA
Screen Interval (feet BGS): NA
Casing Inner Diameter (inches): NA
Initial PID Reading (ppm): NA

Sample ID: AOC9-SW03PM102420 11
Sample Time: 1456
Sample Tubing: ~~QED teflon-lined polyethylene~~ NA
Sample Turbidity (NTUs): 2.13
Initial Water Level (Feet TOIC): NA
Final Water Level (feet TOIC): NA
Casing Type: ~~PVC~~ NA

Time	pH	Temperature (°C)	Conductivity (µs/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Water Level (ft TOIC)	Flow Rate (LPM)	Purge Volume (gallons)	Comments
1456	6.82	11.6	0.344	2.13	NA	212	NA	NA	NA	—

M. Mandzuk 10/24/11

Key:
°C = Degrees centigrade.
BGS = Below ground surface.
DO = Dissolved Oxygen
LPM = Liters per minute
mg/L = Milligrams per liter
mS/cm = microSiemens per centimeter
NTU = Nephelometric turbidity unit.
NTU = Nephelometric turbidity unit.
ORP = Redox potential
ppm = Parts per million.
PVC = Polyvinyl chloride.
TOIC = Top of inner (PVC) casing.

Figure 3-4 ~~Groundwater~~ Sampling Form
Surface Water

Page 1 of 1

F

Photolog

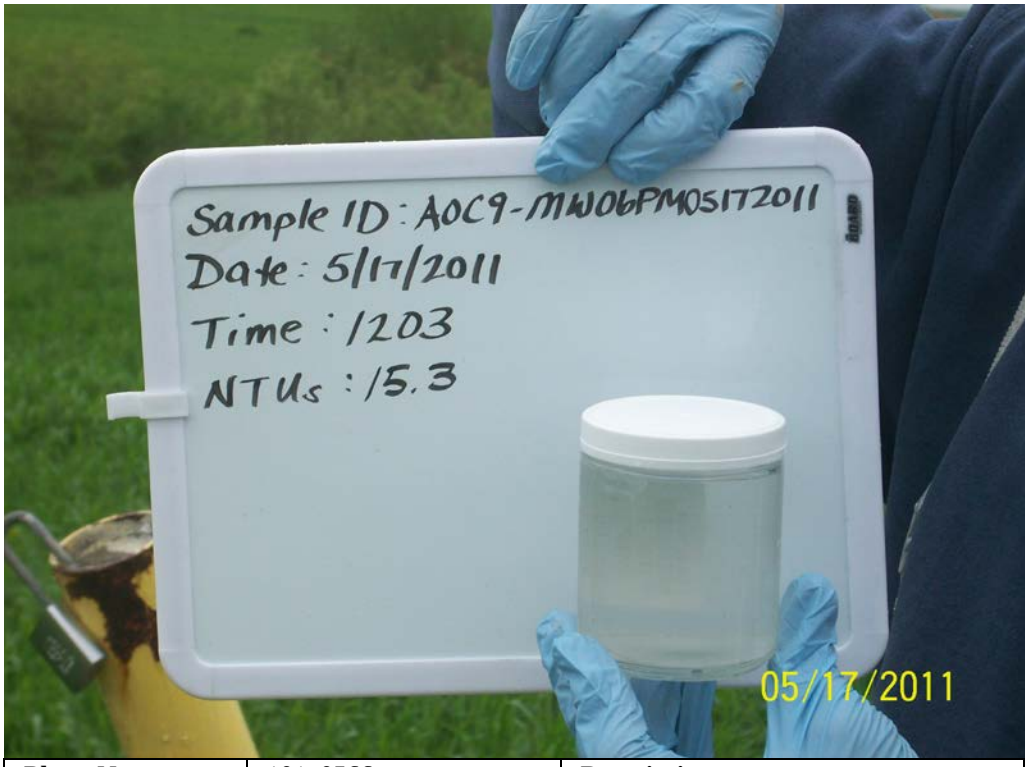


Photo No.:	101_0566	**Description:** Sample: AOC9-MW06PM05172011
Date:	5/17/2011	
Photographer:	M. Horanburg	

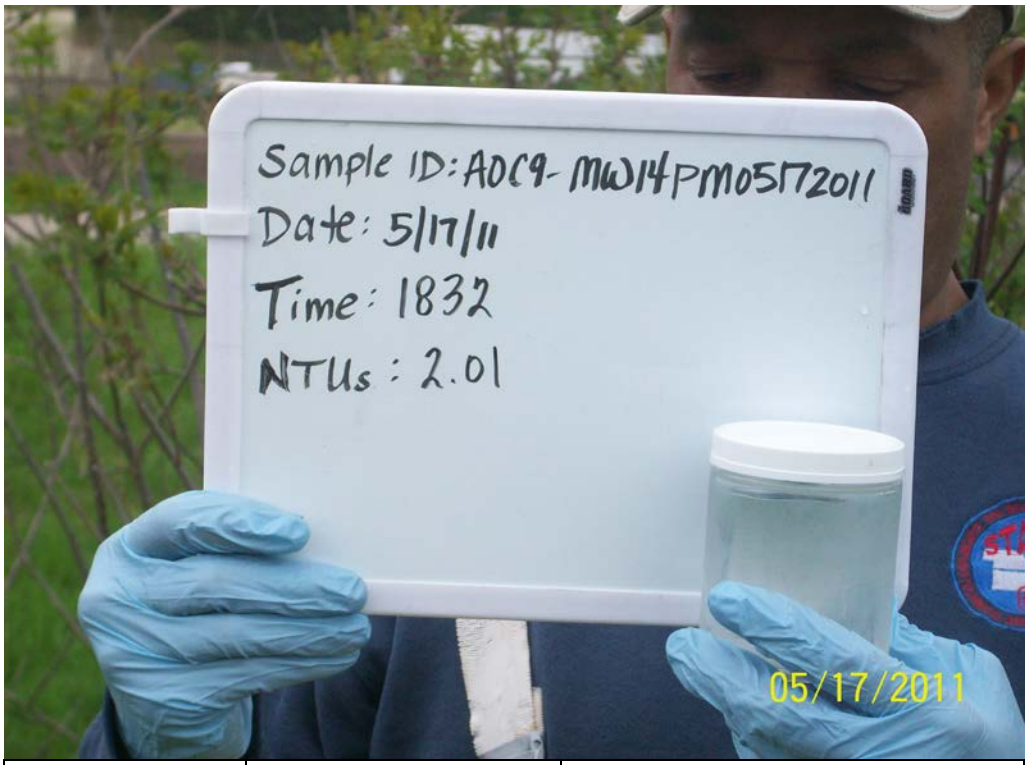


Photo No.:	101_0580	**Description:** Sample: AOC9-MW14PM05172011
Date:	5/17/2011	
Photographer:	M. Horanburg	

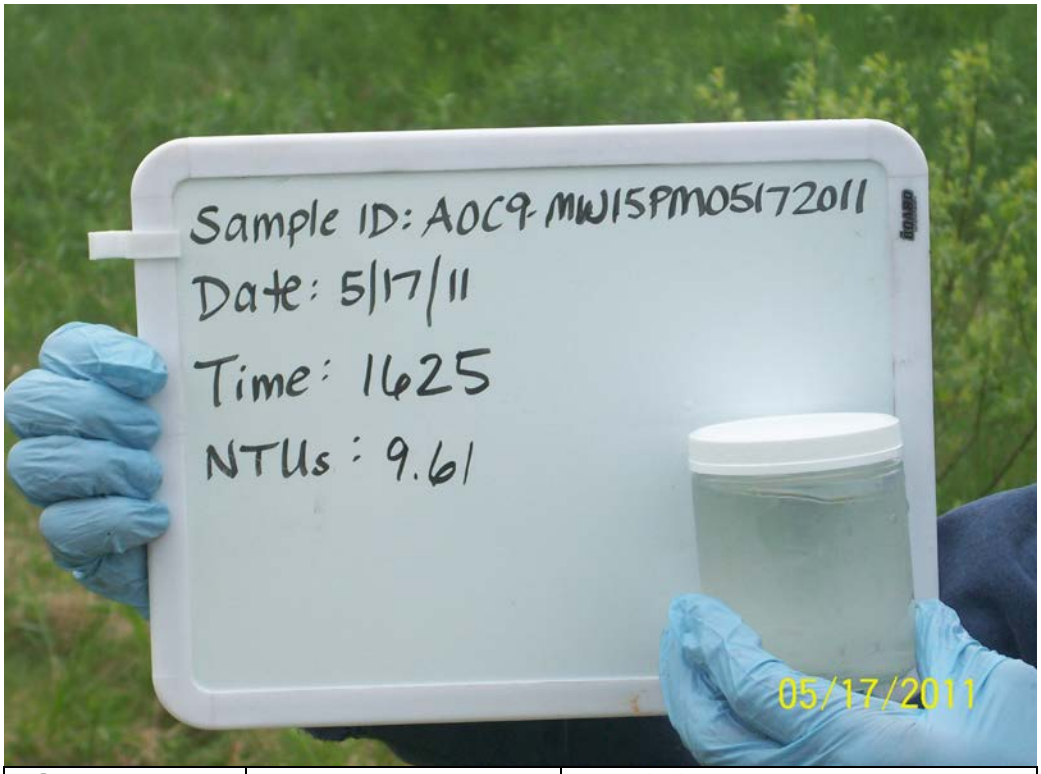


Photo No.:	101_0578	**Description:** Sample: AOC9-MW15PM05172011
Date:	5/17/2011	
Photographer:	M. Horanburg	

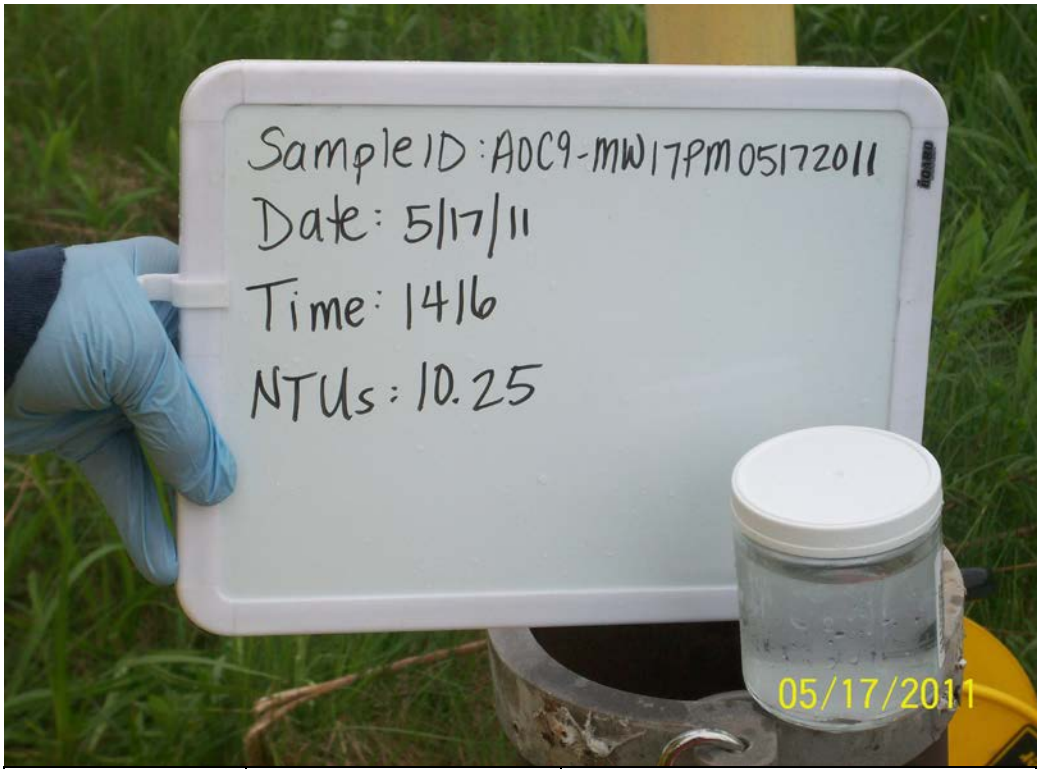


Photo No.:	101_0571	**Description:** Sample: AOC9-MW17PM05172011
Date:	5/17/2011	
Photographer:	M. Horanburg	

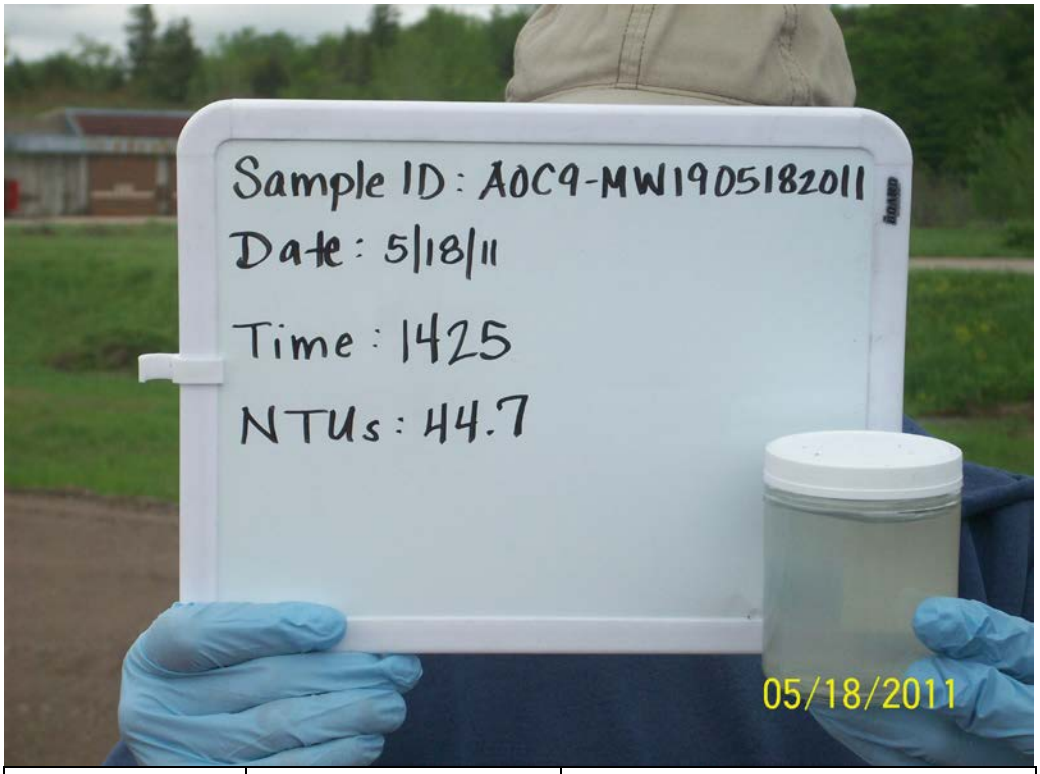


Photo No.:	101_0584	**Description:** Sample: AOC9-MW19PM05182011
Date:	5/18/2011	
Photographer:	M. Horanburg	

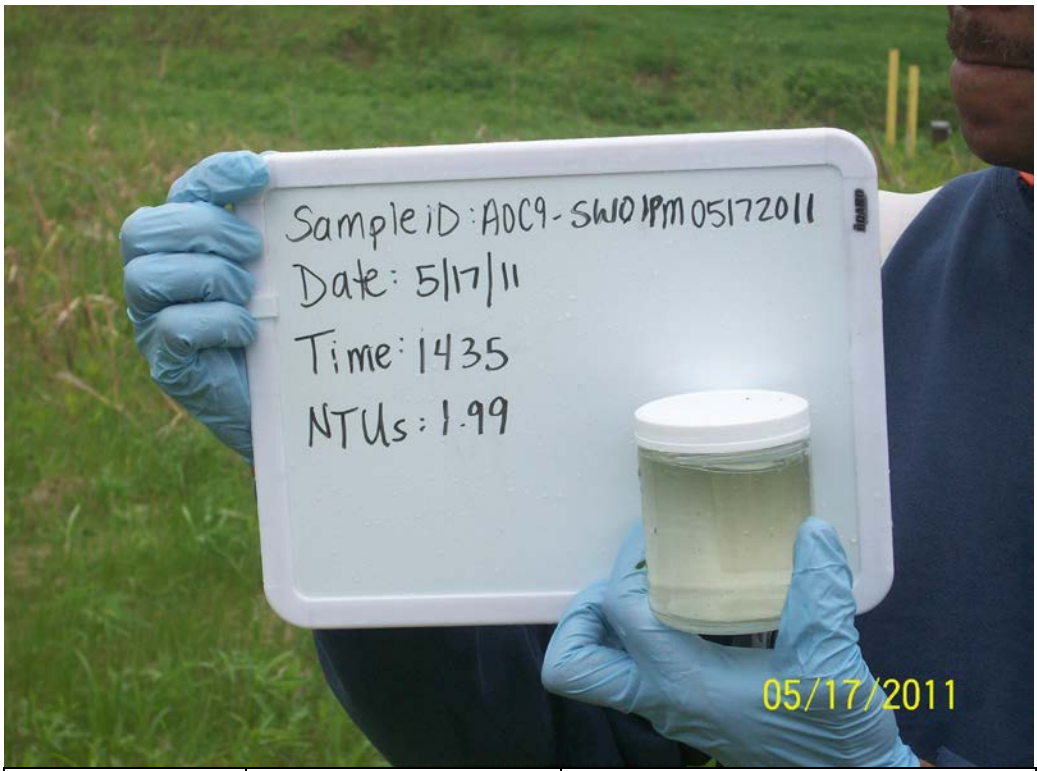


Photo No.:	101_0576	**Description:** Sample: AOC9-SW01PM05172011
Date:	5/17/2011	
Photographer:	M. Horanburg	

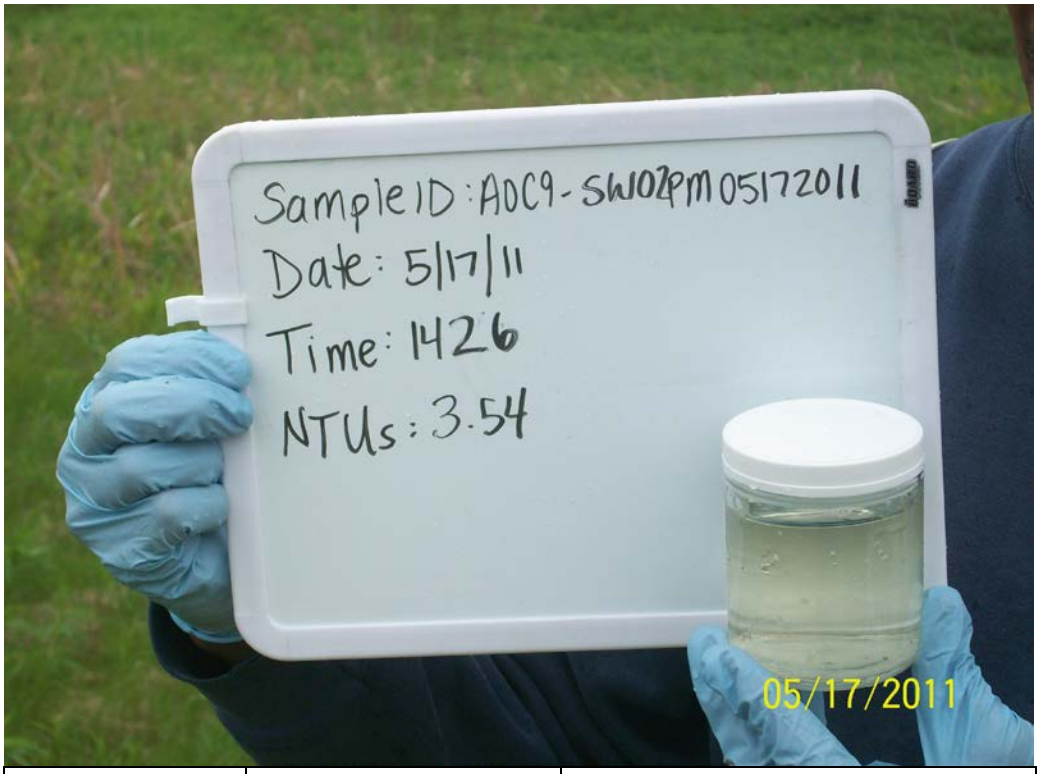


Photo No.:	101_0575	**Description:** Sample: AOC9-SW02PM05172011
Date:	5/17/2011	
Photographer:	M. Horanburg	

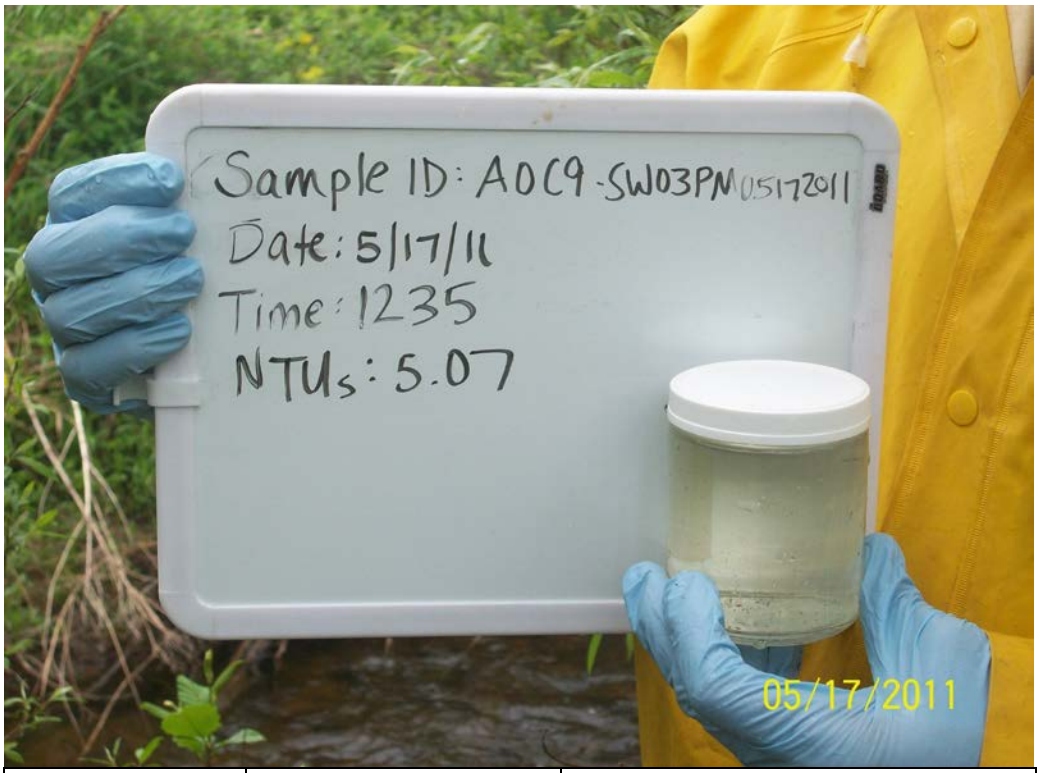


Photo No.:	101_0567	**Description:** Sample: AOC9-SW03PM05172011
Date:	5/17/2011	
Photographer:	M. Horanburg	

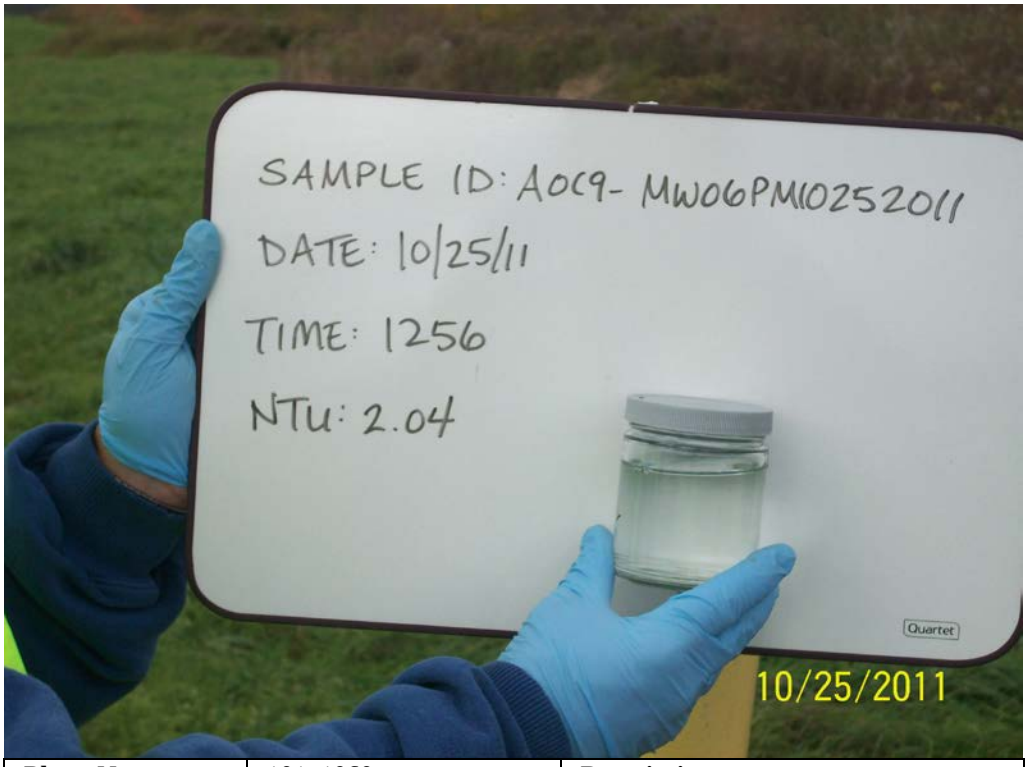


Photo No.:	101_1060	**Description:** Sample: AOC9-MW06PM10252011
Date:	10/25/2011	
Photographer:	M. Horanburg	

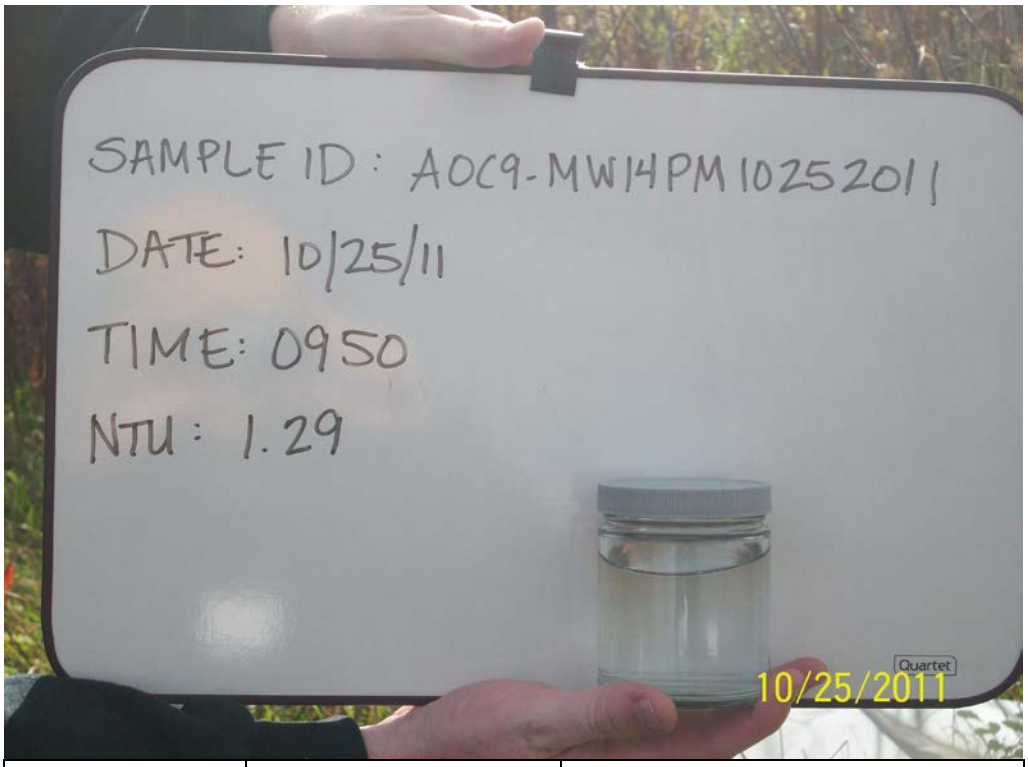


Photo No.:	101_1059	**Description:** Sample: AOC9-MW14PM10252011
Date:	10/25/2011	
Photographer:	M. Horanburg	

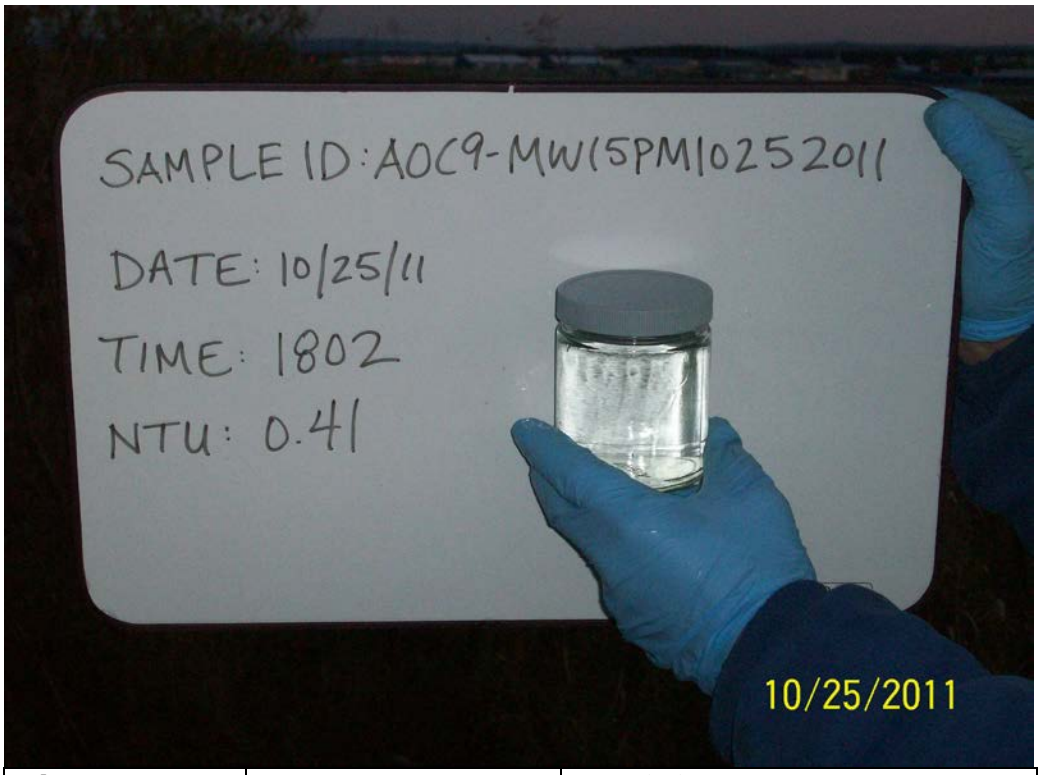


Photo No.:	101_1065	**Description:** Sample: AOC9-MW15PM10252011
Date:	10/25/2011	
Photographer:	M. Horanburg	

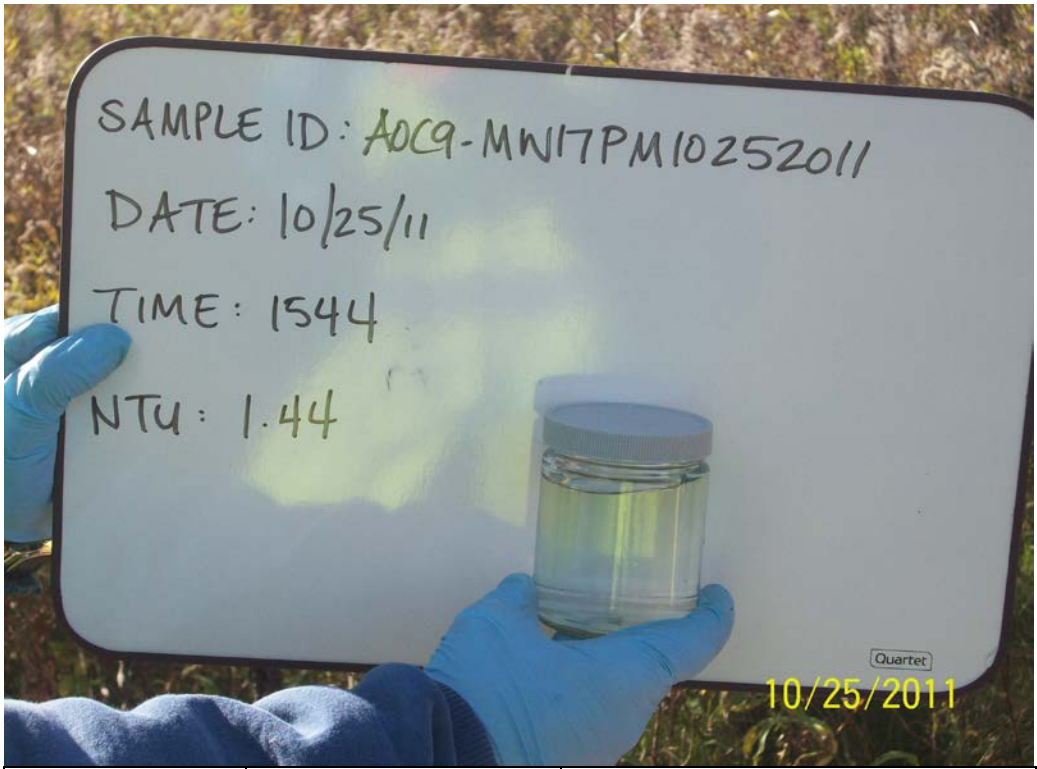


Photo No.:	101_1062	**Description:** Sample: AOC9-MW17PM10252011
Date:	10/25/2011	
Photographer:	M. Horanburg	

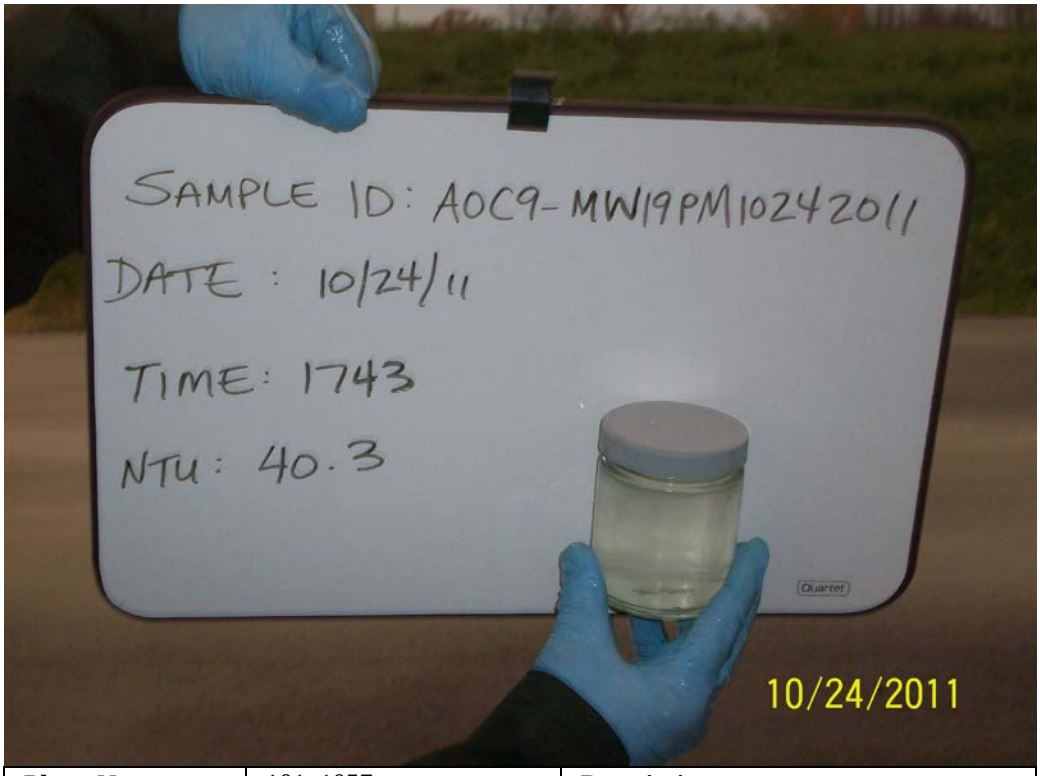


Photo No.:	101_1057	**Description:** Sample: AOC9-MW19PM10242011
Date:	10/24/2011	
Photographer:	M. Horanburg	

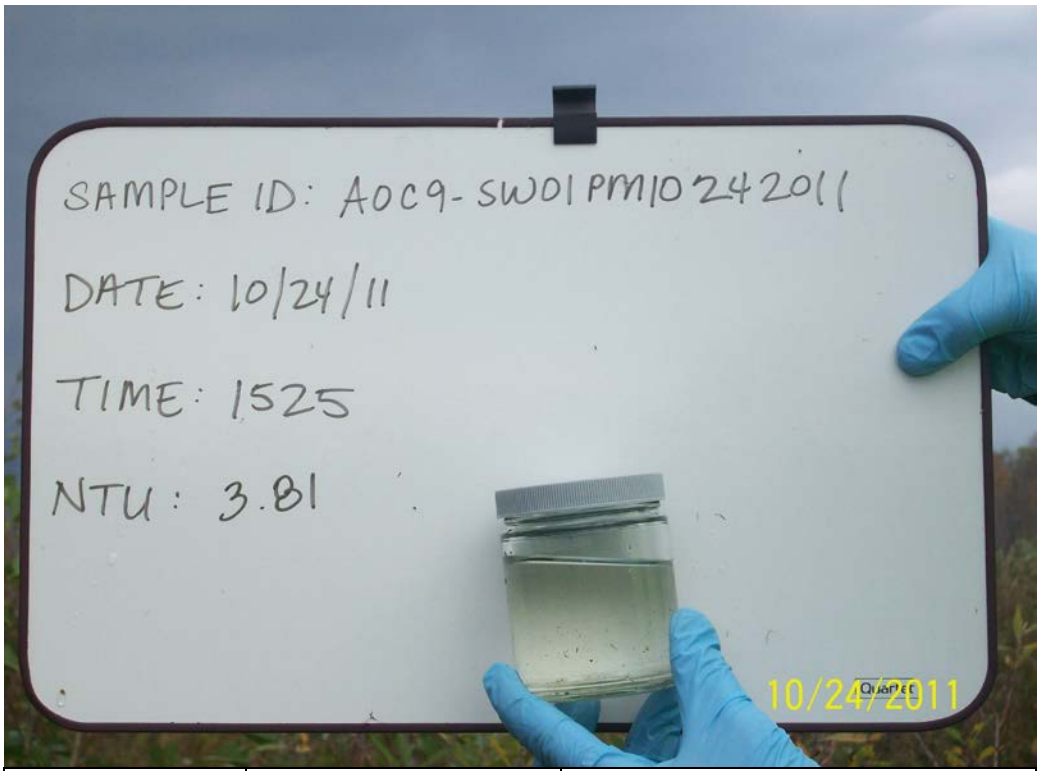


Photo No.:	101_1055	**Description:** Sample: AOC9-SW01PM10242011
Date:	10/24/2011	
Photographer:	M. Horanburg	

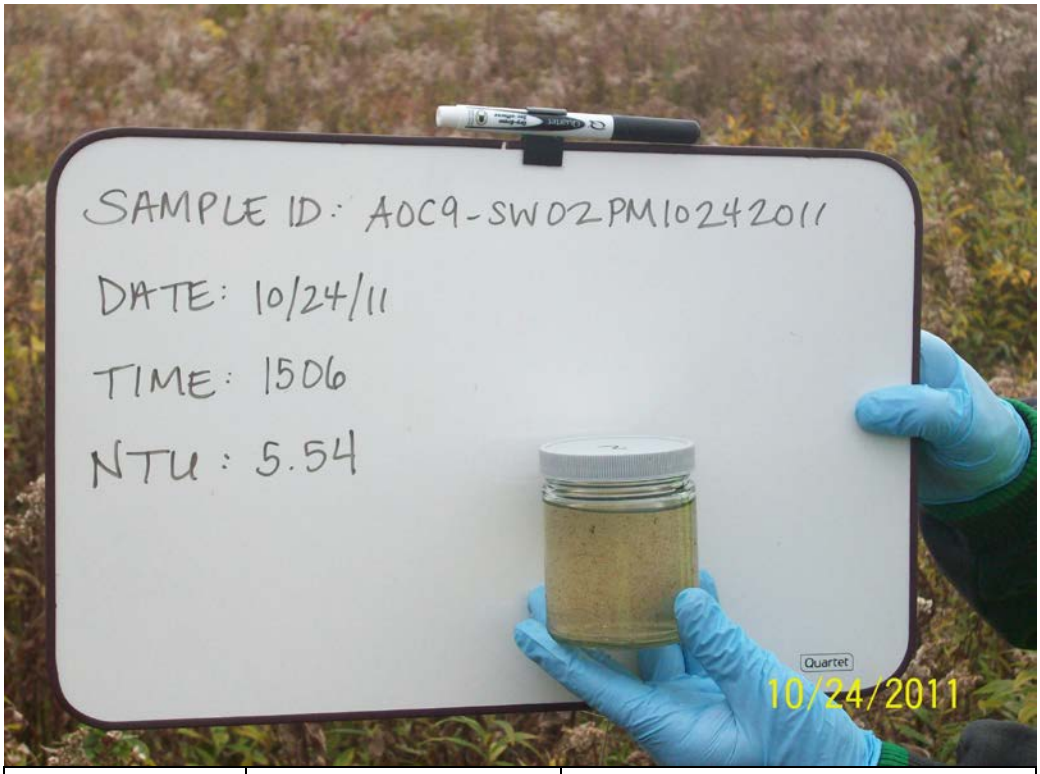


Photo No.:	101_1053	**Description:** Sample: AOC9-SW02PM10242011
Date:	10/24/2011	
Photographer:	M. Horanburg	

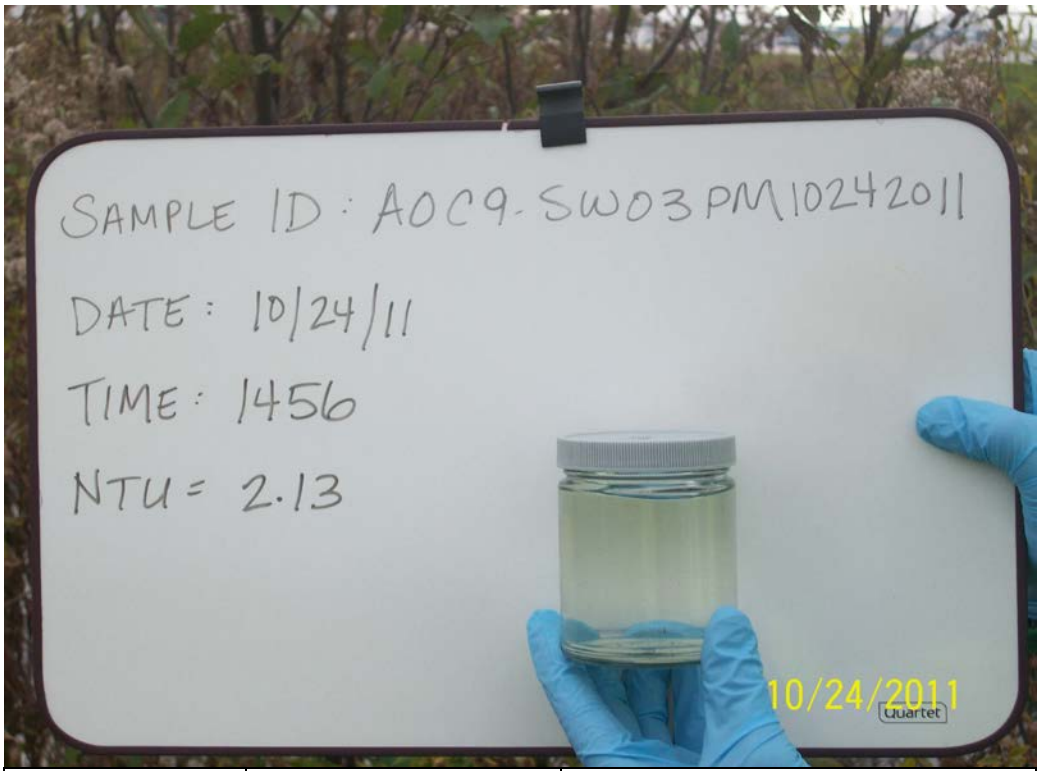


Photo No.:	101_1052	**Description:** Sample: AOC9-SW03PM10242011
Date:	10/24/2011	
Photographer:	M. Horanburg	

G Analytical Data

The analytical data are provided in the attached CD.

H Data Usability Summary Report

Data Usability Summary Report	Project: Griffiss AFB Perform. Monitoring
Date Completed: June 29, 2011	Completed by: B. Kroon

The analytical data provided by the laboratory were reviewed for precision, accuracy, and completeness per NYSDEC Division of Environmental Remediation Guidance for the Development of DUSRs (June 1999). Specific criteria for QC limits were obtained from the Department of Defense (DoD) Quality Systems Manual for Environmental Laboratories Version 4.1. Compliance with the project QA program is indicated on the in the checklist and tables. Any major or minor concerns affected data usability are summarized listed below. The checklist and tables also indicate whether data qualification is required and/or the type of qualifier assigned.

Reference:

Table 1: Sample Data from Electronic Data Deliverable

Lab Sample ID	Client Sample ID	Matrix	Sample Date	MS/MSD	ID Corrections
SE2783-1	AOC9-MW06PM05172011	WG	5/17/2011		
SE2783-2	AOC9-MW17PM05172011	WG	5/17/2011		
SE2783-3	AOC9-MW17/DPM05172011	WG	5/17/2011		
SE2783-4	AOC9-MW15PM05172011	WG	5/17/2011		
SE2783-5	AOC9-MW14PM05172011	WG	5/17/2011	MS/MSD	
SE2783-6	AOC9-MW19PM05182011	WG	5/18/2011		
SE2783-7	AOC9-SW01PM05172011	WS	5/17/2011		
SE2783-8	AOC9-SW02PM05172011	WS	5/17/2011		
SE2783-9	AOC9-SW03PM05172011	WS	5/17/2011		
SE2783-10	AOC9-TB1-05172011	WG	5/17/2011		

Work Orders, Tests and Number of Samples included in this DUSR

Lab Work Orders	Matrix	Test Method	Test Name	Number of Samples
SE2783	Water	SW8260B	VOCs by GCMS Method 8260BB	10

General Sample Information	
Do Samples and Analyses on COC check against Lab Sample Tracking Form?	Yes
Did coolers arrive at lab between 2 and 6^{o}C and in good condition as indicated on COC and Cooler Receipt Form?	Yes
Frequency of Field QC Samples Correct? Field Duplicate - 1/20 samples Trip Blank - Every cooler with VOCs waters only Equipment Blank - 1/ set of samples per day?	Yes – Trip blank included in this SDG. Field duplicates included in this SDG (AOC9-MW17/DBM072810). Equipment blanks were not required due to the use of dedicated sampling equipment.
All ASP Forms complete?	No – AFCEE reporting format.
Case narrative present and complete?	Yes
Any holding time violations (See table below)?	No - All samples were prepared and analyzed within holding times.

The following tables are presented at the end of this DUSR and provided summaries of results outside QC criteria.

- Method Blanks Results (Table 2)

- Surrogates Outside Limits (Table 3)
- MS/MSD Outside Limits (Table 4)
- LCS Outside Limits (Table 5)
- Re-analysis Results (Table 6)
- Field Duplicate Results (Table 7)

Go to Tables List

Volatile Organics Organics by GCMS	
Description	**Notes and Qualifiers**
Any compounds present in method, trip and field blanks (see Table 2)?	Yes – Acetone and 1,4-Dioxane were detected in Trip Blank AOC9-TB1-5172011.
For samples, if results are <5 times the blank or < 10 times blank for common laboratory contaminants then "U" flag data. Qualification also applies to TICs.	Yes – Acetone qualified "U" in samples AOC9-SW02PM05172011 and AOC9-SW03PM05712011.
Surrogate for method blanks and LCS within limits?	Yes
Surrogate for samples and MS/MSD within limits? (See Table 3). All samples should be re-analyzed for VOCs? Samples should re-analyzed if >1 BN and/or > AP for BNAs is out. Matrix effects should be established.	Yes
Laboratory QC frequency one blank and LCS with each batch and one set of MS/MSD per 20 samples?	Yes
MS/MSD within QC criteria (see Table 4)? If out and LCS is compliant, then J flag positive data in original sample due to matrix?	No – 4-methyl-2pentanone and Chlorobenzene were recovered outside QC limits results qualified "J" as estimated at the values reported, RPD for 1,4-Dioxane was above QC Criteria for MS/MSD, results qualified "J" as estimated at the values reported.
LCS within QC criteria (see Table 5)? If out, and the recovery high with no positive values, then no data qualification is required.	Yes
Do internal standards areas and retention time meet criteria? If not was sample re-analyzed to establish matrix (see Table 6)?	Yes
Is initial calibration for target compounds <15 %RSD or curve fit?	No – Acetone, 1,4-Dioxane, and 1,2,3-Trichlorobenzene %RSD exceeded 15%, all positive detections of these compounds are qualified "J", non-detects not qualified. The only detected compound was in the method blank.
Is continuing calibration for target compounds < 20.5%D.	No - %D criteria not met for several compounds. Trans-1,3-dichloropropene and 2-Hexanone is qualified "J" for detects and "UJ" for non-detects for sample AOC9-MW19PM05182011

Data Usability Summary Report	Project: Griffiss AFB Perform. Monitoring
Date Completed: June 29, 2011	Completed by: B. Kroon

Volatile Organics Organics by GCMS	
Description	**Notes and Qualifiers**
Were any samples re-analyzed or diluted (see Table 6)? For any sample re-analysis and dilutions is only one reportable result by flagged?	Yes
For TICs are there any system related compounds that should not be reported?	NA
Do field duplicate results show good precision for all compounds except TICs (see Table 7)?	No – Isopropylbenzene RPD was greater than 35% in the field duplicate pair of AOC9-MW17BM05172011 and AOC9-MW17/DBM05172011 results are qualified "J". The results are near the reporting limit and the overall the precision is acceptable.

Summary of Potential Impacts on Data Usability
Major Concerns
None
Minor Concerns
Results qualified "J" or "UJ" based on trip blank contamination, MS/MSD recovery and RPDs, ICV and CCV %D, and field duplicate RPD.

Table 2 - List of Positive Results for Blank Samples

Method	Sample ID	Samp Type	Analyte	Result	Qual	Anal Type	Units	PQL
SW8260B	AOC9-TB1-5172011	TBLK	Acetone	2	J	A	ug/L	5
SW8260B	AOC9-TB1-5172011	TBLK	1,4-Dioxane	9	J	A	ug/L	100

Table 2A - List of Samples Qualified for Method Blank Contamination

None

Table 2B - List of Samples Qualified for Field Blank Contamination

Method	Blank ID	Analyte	Result	Qual	PQL	Affected Samples
SW8260B	AOC9-TB1-5172011	Acetone	2	J	5	AOC9-SW02PM05172011, AOC9-SW03PM05172011

Table 3 - List of Samples with Surrogates outside Control Limits

None

Table 4 - List MS/MSD Recoveries and RPDs outside Control Limits

Sample Name	Sample Type	Method	Analyte	Low Limit	Upper Limit	Recovery
AOC9-MW14PM05172011	MS	SW8260B	4-methyl-2-pentanone	83	122	124
AOC9-MW14PM05172011	MS	SW8260	Chlorobenzene	89	113	83
AOC9-MW14PM05172011	MSD	SW8260B	Chlorobenzene	89	113	77

Sample Name	MS Recovery	MSD Recovery	RPD	RPD Limit
AOC9-MW14PM05172011	54	70	26	20

Table 5 - List LCS Recoveries outside Control Limits

None

Table 6 –Samples that were Reanalyzed

Sample ID	Lab ID	Method	Sample Type	Action
AOC9-MW17PM05172011	SE2783-2DL	SW8260B	DL	Report for over-range data only
AOC9-MW17/DPM05172011	SE2783-3DL	SW8260B	DL	Report for over-range data only
AOC9-MW15PM05172011	SE2783-4DL	SW8260B	DL	Report for over-range data only
AOC9-MW14PM05172011	SE2783-5DL	SW8260B	DL	Report for over-range data only
AOC9-MW19PM05182011	SE2783-6RA2	SW8260B	RA	Report for Re-analysis 2 data only

Data Usability Summary Report	Project: Griffiss AFB Perform. Monitoring
Date Completed: June 29, 2011	Completed by: B. Kroon

Table 7 – Summary of Field Duplicate Results

Method	Analyte	PQL	AOC9-MW17PM05172011	AOC9-MW17/DPM05172011	RPD	Rating	Sample Qualifier
SW8260B	1,2-Dichlorobenzene	1.00	44.00	43.00	2.30	Good	None
SW8260B	1,3-Dichlorobenzene	1.00	2.00	2.00	0.00	Good	None
SW8260B	1,4-Dichlorobenzene	1.00	24.00	23.00	4.26	Good	None
SW8260B	Benzene	1.00	5.00	5.00	0.00	Good	None
SW8260B	Chlorobenzene	5.00	450.00	440.00	2.25	Good	None
SW8260B	cis-1,2-Dichloroethene	1.00	5.00	5.00	0.00	Good	None
SW8260B	Cyclohexane	1.00	3.00	3.00	0.00	Good	None
SW8260B	Ethylbenzene	1.00	0.40	0.40	0.00	Good	None
SW8260B	Isopropylbenzene	1.00	2.00	1.00	66.67	Poor	J
SW8260B	Methylcyclohexane	1.00	1.00	0.90	10.53	Good	None
SW8260B	sec-Butylbenzene	1.00	0.80	0.70	13.33	Good	None
SW8260B	tert-Butylbenzene	1.00	0.50	0.40	22.22	Good	None
SW8260B	Tetrachloroethene	1.00	0.90	1.00	10.53	Good	None
SW8260B	trans-1,2-Dichloroethene	1.00	1.00	1.00	0.00	Good	None
SW8260B	Trichloroethene	1.00	12.00	12.00	0.00	Good	None
SW8260B	Vinyl Chloride	1.00	4.00	4.00	0.00	Good	None

Key:
A = Analyte
NC = Not Calculated
ND = Not Detected
PQL = Practical Quantitation Limit
RPD = Relative Percent Difference
T = Tentatively Identified Compound

Data Usability Summary Report	Project: Griffiss AFB Performance Monitoring
Date Completed: January 05, 2012	Completed by: B. Kroon

The analytical data provided by the laboratory were reviewed for precision, accuracy, and completeness per NYSDEC Division of Environmental Remediation Guidance for the Development of DUSRs (June 1999). Specific criteria for QC limits were obtained from the Department of Defense (DoD) Quality Systems Manual for Environmental Laboratories Version 4.1. Compliance with the project QA program is indicated on the in the checklist and tables. Any major or minor concerns affected data usability are summarized listed below. The checklist and tables also indicate whether data qualification is required and/or the type of qualifier assigned.

Reference:

Table 1: Sample Data from Electronic Data Deliverable

Lab Sample ID	Client Sample ID	Matrix	Sample Date	MS/MSD	ID Corrections
SE7091-1	AOC9-TB1-10242011	WQ	10/24/2011		
SE7091-2	AOC9SW01PM10242011	WS	10/24/2011		
SE7091-3	AOC9-SW02PM10242011	WS	10/24/2011		
SE7091-4	AOC9-SW03PM10242011	WS	10/24/2011		
SE7091-5	AOC9-MW19PM10252011	WG	10/25/2011		
SE7091-6	AOC9-MW14PM10252011	WG	10/25/2011	MS/MSD	
SE7091-7	AOC9-MW06PM10252011	WG	10/25/2011		
SE7091-8	AOC9-MW17PM10252011	WG	10/25/2011		
SE7091-9	C9-MW17/DPM10252011	WG	10/25/2011		AOC9-MW17/DPM 10252011
SE7091-10	AOC9-RB1-10252011	WQ	10/25/2011		
SE7091-11	AOC9-MW15PM10252011	WG	10/25/2011		

Work Orders, Tests and Number of Samples included in this DUSR

Lab Work Orders	Matrix	Test Method	Test Name	Number of Samples
SE7091	WG	SW8260B	VOCs by GCMS Method 8260B	6
SE7091	WS	SW8260B	VOCs by GCMS Method 8260B	3
SE7091	WQ	SW8260B	VOCs by GCMS Method 8260B	2

General Sample Information	
Do Samples and Analyses on COC check against Lab Sample Tracking Form?	Yes
Did coolers arrive at lab between 2 and 6°C and in good condition as indicated on COC and Cooler Receipt Form?	No – Cooler temps at 0.6°C upon receipt. No indication that samples were frozen.

Frequency of Field QC Samples Correct? Field Duplicate - 1/20 samples Trip Blank - Every cooler with VOCs waters only Equipment Blank - 1/ set of samples per day?	Yes – Trip blank included in this SDG. Field duplicates included in this SDG (AOC9-MW17DPM10252011). Equipment blank ACO9-RB1-10252011 included in this SDG, applies to samples AOC9-MW17PM10252011 and AOC9-MW15PM10252011.
All ASP Forms complete?	No – AFCEE reporting format.
Case narrative present and complete?	Yes
Any holding time violations (See table below)?	No - All samples were prepared and analyzed within holding times.

Insert Holding time table below.

The following tables are presented at the end of this DUSR and provided summaries of results outside QC criteria.

- Method Blanks Results (Table 2)
- Surrogates Outside Limits (Table 3)
- MS/MSD Outside Limits (Table 4)
- LCS Outside Limits (Table 5)
- Re-analysis Results (Table 6)
- Field Duplicate Results (Table 7)

Go to Tables List

Volatile Organics Organics by GCMS	
Description	**Notes and Qualifiers**
Any compounds present in method, trip and field blanks (see Table 2)?	Yes – Several compounds were detected in method, trip, and rinsate blanks.
For samples, if results are <5 times the blank or < 10 times blank for common laboratory contaminants then "U" flag data. Qualification also applies to TICs.	Results qualified based on trip blank and rinsate blank contamination.
Surrogate for method blanks and LCS within limits?	Yes
Surrogate for samples and MS/MSD within limits? (See Table 3). All samples should be re-analyzed for VOCs? Samples should re-analyzed if >1 BN and/or > AP for BNAs is out. Matrix effects should be established.	Yes
Laboratory QC frequency one blank and LCS with each batch and one set of MS/MSD per 20 samples?	Yes
MS/MSD within QC criteria (see Table 4)? If out and LCS is compliant, then J flag positive data in original sample due to matrix?	No – Several compounds were non-compliant results qualified as noted on Table 4.
LCS within QC criteria (see Table 5)? If out, and the recovery high with no positive values, then no data qualification is required.	No – Several compounds were non-compliant results qualified as noted on Table 5.
Do internal standards areas and retention time meet criteria? If not was sample re-analyzed to establish matrix (see Table 6)?	Yes

Data Usability Summary Report	Project: Griffiss AFB Performance Monitoring
Date Completed: January 05, 2012	Completed by: B. Kroon

Volatile Organics Organics by GCMS	
Description	**Notes and Qualifiers**
Is initial calibration for target compounds <15 %RSD or curve fit?	No – Acetone, 2-Hexanone, 1,4-Dioxane %RSD exceeded 15%, all positive detections qualified "J", non-detects not qualified.
Is continuing calibration for target compounds < 20.5%D.	No - %D criteria not met for several compounds. Dichlorodifluoromethane, 1,4-Dioxane, and N-Butylbenzene results qualified J/UJ in samples AOC9-TB1-10242011, AOC9-SW01PM10242011, AOC9-SW02PM10242011, AOC9-SW03PM10242011, AOC9-MW19PM10242011, AOC9-MW14PM10252011, AOC9-MW06PM10252011, AOC9-MW17PM10252011, AOC9-MW17/DPM10252011, AOC9-RB1-10252011, AOC9-MW15PM10252011.
Were any samples re-analyzed or diluted (see Table 6)? For any sample re-analysis and dilutions is only one reportable result by flagged?	Yes- Dilution results only reported where initial run was above calibration range.
For TICs are there any system related compounds that should not be reported?	NA
Do field duplicate results show good precision for all compounds except TICs (see Table 7)?	No- Several compounds exceeded criteria.

Summary of Potential Impacts on Data Usability
Major Concerns
None
Minor Concerns
Results qualified based on trip blank contamination, rinsate blank contamination, ICV and CCV %D, LCS recovery, MS/MSD recovery and RPD and field duplicate RPD.

Data Usability Summary Report	Project: Griffiss AFB Performance Monitoring
Date Completed: January 05, 2012	Completed by: B. Kroon

Table 2 - List of Positive Results for Blank Samples

Method	Sample ID	Samp Type	Analyte	Result	Qual	Anal Type	Units	PQL
SW8260B	AOC9-TB1-10242011	TB	Chloromethane	0.8	J	A	ug/L	2.0
SW8260B	AOC9-TB1-10242011	TB	Acetone	5	J	A	ug/L	5.0
SW8260B	AOC9-RB1-10252011	RB	Acetone	3	J	A	ug/L	5.0
SW8260B	AOC9-RB1-10252011	RB	Chlorobenzene	2		A	ug/L	1.0
SW8260B	AOC9-RB1-10252011	RB	1,2-Dichlorobenzene	0.3	J	A	ug/L	1.0
SW8260B	AOC9-RB1-10252011	RB	1,2,3-Trichlorobenzene	1.0	J	A	ug/L	1.0
SW8260B	AOC9-RB1-10252011	RB	N-Propylbenzene	2.0		A	ug/L	1.0
SW8260B	AOC9-RB1-10252011	RB	Naphthalene	3.0		A	ug/L	1.0
SW8260B	WG100702-Blank	MB	Methylene Chloride	3.0	J	A	ug/L	1.0

Table 2A - List of Samples Qualified for Method Blank Contamination

None

Data Usability Summary Report	Project: Griffiss AFB Performance Monitoring
Date Completed: January 05, 2012	Completed by: B. Kroon

Table 2B - List of Samples Qualified for Field Blank Contamination

Method	Blank ID	Analyte	Result	Qual	PQL	Affected Samples
SW8260B	AOC9-RB1-10252011	Acetone	3.0	J	5.0	AOC9-MW15PM10252011
SW8260B	AOC9-RB1-10252011	Chlorobenzene	2.0		1.0	None
SW8260B	AOC9-RB1-10252011	N-Propylbenzene	2.0		1.0	AOC9-MW15PM10252011
SW8260B	AOC9-RB1-10252011	Naphthalene	3.0		1.0	AOC9-MW15PM10252011
SW8260B	AOC9-TB1-10242011	Acetone	5	J	5.0	AOC9-SW02PM10242011, AOC9-SW03PM10242011, AOC9-MW19PM10242011, AOC9-MW14PM10252011, AOC9-MW06PM10252011, AOC9-MW17PM10252011

Table 3 - List of Samples with Surrogates outside Control Limits

None

Table 4 - List MS/MSD Recoveries and RPDs outside Control Limits

Method	Sample ID	Sample Type	Analyte	Orig. Result	Spike Amount	Rec.	Dil Fac	Low Limit	High Limit	Sample Qual.
SW8260B	AOC9-MW14PM10252011	MS	Chloromethane	ND	50	131	1	59	123	UJ
SW8260B	AOC9-MW14PM10252011	MSD	Chloromethane	ND	50	132	1	59	123	UJ

Method	Sample ID	Sample Type	Analyte	Orig. Result	Spike Amount	Rec.	Dil Fac	Low Limit	High Limit	Sample Qual.
SW8260B	AOC9-MW14PM10252011	MS	Chlorobenzene	306	50	8	1	89	113	J
SW8260B	AOC9-MW14PM10252011	MS	N-Butylbenzene	1.5	50	122	1	78	121	J
SW8260B	AOC9-MW14PM10252011	MSD	P-Isopropyltoluene	ND	50	123	1	88	121	UJ

Method	Sample ID	Sample Type	Analyte	RPD	RPD Limit	Sample Qual.
SW8260	AOC9-MW14PM10252011	MSD	1,4-Dioxane	86	20	J Flag
SW8260	AOC9-MW14PM10252011	MSD	Chlorobenzene	1000	20	J Flag

Table 5 - List LCS Recoveries outside Control Limits

Sample ID	Analyte	Method	Rec.	Low Limit	High Limit	No. of Affected Samples	Samp Qual
WG100501-LCS	Chloromethane	SW8260 B	132	59	123	6	J/UJ
WG100501-LCS	2-Hexanone	SW8260 B	125	80	124	6	J/UJ
WG100501-LCS	p-Isopropyltoluene	SW8260 B	123	88	121	6	J/UJ
WG100624-LCS	Acetonitrile	SW8260 B	58	61	125	5	J/UJ
WG100624-LCS	Propionitrile	SW8260 B	73	75	118	5	J/UJ

Data Usability Summary Report	Project: Griffiss AFB Performance Monitoring
Date Completed: January 05, 2012	Completed by: B. Kroon

Table 6 –Samples that were Reanalyzed

Sample ID	Lab ID	Method	Sample Type	Action
AOC9-MW14PM10252011	SE7091-6DL	SW8260B	DL	Report for over-range data only
AOC9-MW17PM10252011	SE7091-8DL	SW8260B	DL	Report for over-range data only
AOC9-MW17/DPM10252011	SE7091-9DL	SW8260B	DL	Report for over-range data only
AOC9-MW15PM10252011	SE7091-11DL	SW8260B	DL	Report for over-range data only

Table 7 – Summary of Field Duplicate Results

Analyte	AOC9-MW17PM10252011	AOC9-MW17/DPM10252011	RPD	Rating	Sample Qualifier
1,2-Dichlorobenzene	69.00	69.00	0.00	Good	None
1,3-Dichlorobenzene	2.00	2.00	0.00	Good	None
1,4-Dichlorobenzene	26.00	28.00	7.41	Good	None
1,2-Dichloroethane	0.40	0.40	0.00	Good	None
Benzene	6.00	3.00	66.67	Poor	J
Chlorobenzene	540.00	530.00	1.87	Good	None
cis-1,2-Dichloroethene	4.00	4.00	0.00	Good	None
Cyclohexane	0.70	0.40	54.55	Poor	J
Ethylbenzene	1.00	0.30	107.69	Poor	J
Isopropylbenzene	2.00	1.00	66.67	Poor	J
sec-Butylbenzene	0.60	0.70	15.38	Good	None
Tetrachloroethene	2.00	2.00	0.00	Good	None
trans-1,2-Dichloroethene	0.50	0.60	18.18	Good	None
Trichloroethene	14.00	16.00	13.33	Good	None
Vinyl Chloride	3.00	4.00	28.57	Good	None

Data Usability Summary Report	Project: Griffiss AFB Performance Monitoring
Date Completed: January 05, 2012	Completed by: B. Kroon

Key:
A = Analyte
NC = Not Calculated
ND = Not Detected
PQL = Practical Quantitation Limit
RPD = Relative Percent Difference
T = Tentatively Identified Compound

Field Adjustment Forms

Field Adjustment Form No. 1
Former Griffiss AFB

To:	Mr. Douglas M. Pocze USEPA - Region 2 Federal Facilities Section 290 Broadway New York, NY 10007 Fax: (212) 637-3256 Office: (212 637-4432	Ms. Heather Bishop NYSDEC Division of Environmental Remediation Remedial Bureau A 625 Broadway, 11th floor Albany, NY 12233-7015 Fax: (518) 402-9022 Office: (518) 402-9692	
From:	Ms. Catherine Jerrard, P.E., PMP AFCEE/EXC-Griffiss 428 Phoenix Drive Rome, NY 13441-4105 Fax: (315) 356-0816 Office: (315) 356-0810	**Date:** 4-7-11 / 4-14-11 **Time:** 0800	
Site:	AOC 9	**Work Plan Section:** 2.6	**Page:** 2-10

Need for Field Adjustment

- Soil cuttings from MW19 were drummed, along with development water, in a separate drum. Both drums were stored in Bunker 913.

- well MW19 was developed using a peristaltic pump and dedicated tubing using a flow through cell to measure field parameters, in lieu of a submersible pump.

Prepared by:	Organization	Date:
Allison Menger	PARSONS	4-14-11
Approved by:	**Org:**	**Date:**
	USACE	

Figure 3-6 Field Adjustment Form

Field Adjustment Form No. 001
Former Griffiss AFB

To:	Mr. Douglas M. Pocze USEPA - Region 2 Federal Facilities Section 290 Broadway New York, NY 10007 Fax: (212) 637-3256 Office: (212 637-4432	Ms. Heather Bishop NYSDEC Division of Environmental Remediation Remedial Bureau A 625 Broadway, 11th floor Albany, NY 12233-7015 Fax: (518) 402-9022 Office: (518) 402-9692
From:	Ms. Catherine Jerrard, P.E., PMP AFCEE/EXC-Griffiss 428 Phoenix Drive Rome, NY 13441-4105 Fax: (315) 356-0816 Office: (315) 356-0810	**Date:** Monday, 10/24/2011 **Time:** 1415
Site: Former GAFB - AOC9		**Work Plan Section:** 3.3.3 **Page:** 3-16

Need for Field Adjustment

Equipment rental company failed to send calibration solutions for the Horiba 22. Call was placed to rental company to confirm in shop calibration. A calibration certificate was provided and solutions would be overnighted. Since Horiba 22 had been calibrated in shop prior to shipment; sampling was continued to prevent any delays.

(See attached calibration certificate)

Prepared by:	Organization	Date:
M Horanburg / Mhoranburg	Ecology and Environment Engineering, P.C.	10/24/11
Approved by:	**Org:**	**Date:**
	USACE	

Figure 3-6 Field Adjustment Form

Ashtead TECHNOLOGY

Calibration Certificate

Asset No:	**R9895**
Description	**HORIBA U-22XD 2M**
Serial No:	**609004**
Manufacturer:	**Horiba**
Calibration Date:	**19 October 2011**
Next Calibration:	**Refer to Manufacturers Instructions**
Accuracy of Unit Under Test:	
Adjustments made:	**None**
Calibration Technician:	**Timothy Paules**

Details of any limitations to the use of the equipment
None

The following measurement equipment used during the calibration procedure is traceable to National Standards.

Measurement Equipment/Standards	Reference
THERMOMETER - 1 TO 51C - 8118	128297
VAISALA HM70 - F4250027/F4330002	H45-10430083
AutoCal - C143849	C143849
BUFFER, REF STD, PH 7.00 - PT1	PT1
STABLCAL TURBIDITY STD - A0347	A0347
Sodium Sulfite - 086037A	086037
Zobell ORP Solution - 11B101053	11B101053

Calibrated By:

Timothy Paules

Test Results

Question	Result
What is the pH value in the AutoCal Solution?	4.00 pH
What is the conductivity reading in the AutoCal solution?	4.49 mS/cm
What is the turbidity reading in the AutoCal solution?	0.0 NTU
What is the DO reading in the AutoCal solution? This will vary considerably depending on temperature.	8.89 mg/l
Is the temperature reading in the AutoCal solution within 1.0 C of reading with workshop thermometer?	Yes
What is the pH 7 reading?	7.02 pH
Rinse probe with DI water and shake off excess. Adjust conductivity zero if needed. What is the conductivity zero reading?	0.0 mS/cm
What is the turbidity span reading?	201 NTU
What is the ZERO DO reading?	0.03 mg/l
Is ORP within 15mV of standard ORP solution?	Yes
Verify the conductivity temperature compensation is enabled and set to 2.00%/C	Yes

Philadelphia, PA 1016 West Eighth Avenue Suite C King of Prussia PA 19406

Field Adjustment Form No. 002
Former Griffiss AFB

To: Mr. Douglas M. Pocze USEPA - Region 2 Federal Facilities Section 290 Broadway New York, NY 10007 Fax: (212) 637-3256 Office: (212 637-4432	Ms. Heather Bishop NYSDEC Division of Environmental Remediation Remedial Bureau A 625 Broadway, 11th floor Albany, NY 12233-7015 Fax: (518) 402-9022 Office: (518) 402-9692
From: Ms. Catherine Jerrard, P.E., PMP AFCEE/EXC-Griffiss 428 Phoenix Drive Rome, NY 13441-4105 Fax: (315) 356-0816 Office: (315) 356-0810	**Date:** Tuesday, 10/25/2011 **Time:** 1345
Site: Former GAFB-AOC9	**Work Plan Section:** 3.3.1, 3.3.2 **Page:** 3-10, 3-13, 3-15

Need for Field Adjustment

As begin to attempt purging at MW17, no water was being discharged by pump. EEEPC personnel attempted to troubleshoot tubing lines and bladder pump. In attempts to confirm bladder pump was not functioning, a smaller back up bladder pump was attached to the tubing and lowered into the water at MW17, to see if water would discharge when pump was running. It was found the back up pump did work and original bladder pump was non-functional. Per USACE allowance, purging and sampling continued at MW17 with the smaller pump. However, the pump (due to length [size]) it would not sit at the midpoint of the screened portion of the well. ~~Purging and sampling were completed.~~

Prepared by:	Organization	Date:
M. Horanburg / MHoranburg	Ecology and Environment Engineering, P.C.	10/25/11
Approved by:	**Org:** USACE	**Date:**

Figure 3-6 Field Adjustment Form

Field Adjustment Form No. 003
Former Griffiss AFB

To: Mr. Douglas M. Pocze USEPA - Region 2 Federal Facilities Section 290 Broadway New York, NY 10007 Fax: (212) 637-3256 Office: (212 637-4432	Ms. Heather Bishop NYSDEC Division of Environmental Remediation Remedial Bureau A 625 Broadway, 11th floor Albany, NY 12233-7015 Fax: (518) 402-9022 Office: (518) 402-9692
From: Ms. Catherine Jerrard, P.E., PMP AFCEE/EXC-Griffiss 428 Phoenix Drive Rome, NY 13441-4105 Fax: (315) 356-0816 Office: (315) 356-0810	**Date:** Tuesday, 10/25/2011 **Time:** 1610
Site: Former GAFB-AOC9	**Work Plan Section:** 3.3.1, 3.3.2 **Page:** 3-10, 3-13, 3-15

Need for Field Adjustment

As attempt to begin purging at MW15, no water was being discharged by pump (similar to MW17; see field adj. form # 002). Trouble shooting by ~~EEEPC~~ again identified that the bladder pump was not functioning. Per allowance by USACE, the small back up bladder pump was used to purge and sample at MW15. Prior to placement in MW15, the back up pump was deconned with alconox and DI water. A rinsate blank was collected after the completion of decontamination. Similar to MW17, due to the length (size) of the back up pump, it would not sit at the midpoint of the screened portion of the well. ~~Sampling~~ MH 10/25/11 Purging and sampling were completed.

Prepared by:	Organization	Date:
M. Horanburg	Ecology and Environment Engineering, P.C.	10/25/11
Approved by:	**Org:** USACE	**Date:**

Figure 3-6 Field Adjustment Form

J

MAROS

MAROS Site Results

Project: AOC 9 **User Name:** Jenkins

Location: Griffiss AFB **State:** New York

User Defined Site and Data Assumptions:

Hydrogeology and Plume Information:

Groundwater Seepage Velocity: 87.5 ft/yr

Current Plume Length: 840 ft

Current Plume Width 400 ft

Number of Tail Wells: 6

Number of Source Wells: 1

Down-gradient Information:

Distance from Edge of Tail to Nearest:

Down-gradient receptor: 1 ft

Down-gradient property: 1 ft

Distance from Source to Nearest:

Down-gradient receptor: 1140 ft

Down-gradient property: 1140 ft

Source Information:

Source Treatment: In-situ Biodegradation

NAPL is not observed at this site.

Data Consolidation Assumptions:

Time Period: 12/18/1997 **to** 10/24/2011
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: Specified Detection Limit
J Flag Values : Actual Value

Plume Information Weighting Assumptions:

Consolidation Step 1. Weight Plume Information by Chemical
Summary Weighting: Weighting Applied to All Chemicals Equally
Consolidation Step 2. Weight Well Information by Chemical
Well Weighting: Well Weighting was applied.
Chemical Weighting: Weights for Individuals Chemicals were Applied.

Note: These assumptions were made when consolidating the historical montoring data and lumping the Wells and COCs.

1. Compliance Monitoring/Remediation Optimization Results:

Preliminary Monitoring System Optimization Results: Based on site classification, source treatment and Monitoring System Category the following suggestions are made for site Sampling Frequency, Duration of Sampling before reassessment, and Well Density. These criteria take into consideration: Plume Stability, Type of Plume, and Groundwater Velocity.

COC	Tail Stability	Source Stability	Level of Effort	Sampling Duration	Sampling Frequency	Sampling Density
1,2-DICHLOROBENZENE	PD	N/A	N/A	Continue remediation mechanism unitl reach stable trend or	No Recommendation	24
1,4-DICHLOROBENZENE	D	N/A	N/A	Continue remediation mechanism unitl reach stable trend or	No Recommendation	24
CHLOROBENZENE	D	N/A	N/A	Continue remediation mechanism unitl reach stable trend or	No Recommendation	24
TRICHLOROETHYLENE (TCE)	S	N/A	N/A	Remove treatment system if previously reducing concentation	No Recommendation	24

Note:

Plume Status: (I) Increasing; (PI)Probably Increasing; (S) Stable; (NT) No Trend; (PD) Probably Decreasing; (D) Decreasing

Design Categories: (E) Extensive; (M) Moderate; (L) Limited (N/A) Not Applicable, Insufficient Data Available

Level of Monitoring Effort Indicated by Analysi Limited

2. Spatial Moment Analysis Results:

Moment Type	Constituent	Coefficient of Variation	Mann-Kendall S Statistic	Confidence in Trend	Moment Trend
Zeroth Moment: Mass					
	1,2-DICHLOROBENZENE	2.65	2	55.7%	NT
	1,4-DICHLOROBENZENE	2.65	2	55.7%	NT
	CHLOROBENZENE	2.65	2	55.7%	NT
	TRICHLOROETHYLENE (TCE)	2.65	2	55.7%	NT
1st Moment: Distance to Source					
	1,2-DICHLOROBENZENE	0.00	0	0.0%	N/A
	1,4-DICHLOROBENZENE	0.00	0	0.0%	N/A
	CHLOROBENZENE	0.00	0	0.0%	N/A
	TRICHLOROETHYLENE (TCE)	0.00	0	0.0%	N/A
2nd Moment: Sigma XX					
	1,2-DICHLOROBENZENE	0.00	0	0.0%	N/A
	1,4-DICHLOROBENZENE	0.00	0	0.0%	N/A
	CHLOROBENZENE	0.00	0	0.0%	N/A
	TRICHLOROETHYLENE (TCE)	0.00	0	0.0%	N/A
2nd Moment: Sigma YY					
	1,2-DICHLOROBENZENE	0.00	0	0.0%	N/A
	1,4-DICHLOROBENZENE	0.00	0	0.0%	N/A
	CHLOROBENZENE	0.00	0	0.0%	N/A
	TRICHLOROETHYLENE (TCE)	0.00	0	0.0%	N/A

Note: The following assumptions were applied for the calculation of the Zeroth Moment:

Porosity: 0.40 **Saturated Thickness:** Uniform: 20 ft

Mann-Kendall Trend test performed on all sample events for each constituent. Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A)-Due to insufficient Data (< 4 sampling events).

MAROS Linear Regression Statistics Summary

Project: AOC 9

User Name: Jenkins

Location: Griffiss AFB

State: New York

Time Period: 12/18/1997 **to** 10/24/2011
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: Specified Detection Limit
J Flag Values : Actual Value

Well	Source/ Tail	Average Conc (mg/L)	Median Conc (mg/L)	Standard Deviation	All Samples "ND" ?	Ln Slope	Coefficient of Variation	Confidence in Trend	Concentration Trend
1,2-DICHLOROBENZENE									
AOC9-MW06	T	3.0E-03	3.0E-03	0.0E+00	Yes	0.0E+00	0.00	100.0%	ND
AOC9-MW14	T	1.0E-01	1.0E-01	5.7E-02	No	-6.2E-04	0.55	90.3%	PD
AOC9-MW15	T	5.4E-02	5.7E-02	2.0E-02	No	-2.1E-04	0.38	68.9%	S
AOC9-MW17	T	5.7E-02	5.8E-02	1.2E-02	No	-9.6E-05	0.21	68.3%	S
AOC9-MW19	S	6.0E-03	6.0E-03	0.0E+00	No	0.0E+00	0.00	0.0%	N/A
G009-MW01	T	1.2E-03	6.8E-04	1.2E-03	No	-1.6E-04	1.04	67.3%	NT
G009-MW02	T	3.0E-03	3.0E-03	0.0E+00	Yes	0.0E+00	0.00	100.0%	ND
1,4-DICHLOROBENZENE									
AOC9-MW06	T	3.0E-03	3.0E-03	0.0E+00	Yes	0.0E+00	0.00	100.0%	ND
AOC9-MW14	T	7.1E-02	7.0E-02	3.4E-02	No	-5.2E-04	0.48	91.4%	PD
AOC9-MW15	T	6.5E-02	6.1E-02	3.4E-02	No	-5.8E-04	0.52	93.0%	PD
AOC9-MW17	T	2.6E-02	2.5E-02	8.7E-03	No	2.6E-04	0.33	82.7%	NT
AOC9-MW19	S	3.5E-03	3.5E-03	7.1E-04	No	0.0E+00	0.00	0.0%	N/A
G009-MW01	T	3.0E-03	3.0E-03	0.0E+00	Yes	0.0E+00	0.00	100.0%	ND
G009-MW02	T	3.0E-03	3.0E-03	0.0E+00	Yes	0.0E+00	0.00	100.0%	ND
CHLOROBENZENE									
AOC9-MW06	T	5.0E-03	5.0E-03	0.0E+00	Yes	3.0E-35	0.00	100.0%	ND
AOC9-MW14	T	1.1E+00	1.2E+00	5.9E-01	No	-6.1E-04	0.53	85.8%	S
AOC9-MW15	T	1.1E+00	1.1E+00	6.3E-01	No	-6.4E-04	0.55	89.1%	S
AOC9-MW17	T	5.0E-01	5.0E-01	2.1E-01	No	4.4E-04	0.42	89.0%	NT
AOC9-MW19	S	1.6E-02	1.6E-02	2.8E-03	No	0.0E+00	0.00	0.0%	N/A
G009-MW01	T	5.0E-03	5.0E-03	0.0E+00	Yes	0.0E+00	0.00	100.0%	ND
G009-MW02	T	5.0E-03	5.0E-03	0.0E+00	Yes	-3.0E-35	0.00	100.0%	ND
TRICHLOROETHYLENE (TCE)									
AOC9-MW06	T	1.1E-03	1.0E-03	3.7E-04	No	-1.6E-05	0.33	56.6%	S
AOC9-MW14	T	9.2E-03	3.4E-03	1.3E-02	No	-3.2E-04	1.37	60.5%	NT
AOC9-MW15	T	2.4E-03	2.0E-03	1.9E-03	No	-1.0E-03	0.82	90.0%	S
AOC9-MW17	T	1.5E-02	1.4E-02	3.0E-03	No	-2.1E-04	0.20	95.8%	D
AOC9-MW19	S	5.0E-04	5.0E-04	0.0E+00	No	0.0E+00	0.00	0.0%	N/A
G009-MW01	T	1.8E-03	8.8E-04	2.1E-03	No	-3.6E-04	1.15	88.5%	NT
G009-MW02	T	1.8E-03	8.8E-04	1.9E-03	No	-3.4E-04	1.03	91.8%	PD

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Non-detect (ND); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); COV = Coefficient of Variation

MAROS Mann-Kendall Statistics Summary

Project: AOC 9
User Name: Jenkins
Location: Griffiss AFB
State: New York

Time Period: 12/18/1997 **to** 10/24/2011
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: Specified Detection Limit
J Flag Values : Actual Value

Well	Source/ Tail	Number of Samples	Number of Detects	Coefficient of Variation	Mann-Kendall Statistic	Confidence in Trend	All Samples "ND" ?	Concentration Trend
1,2-DICHLOROBENZENE								
AOC9-MW06	T	5	0	0.00	0	40.8%	Yes	ND
AOC9-MW14	T	4	4	0.55	-6	95.8%	No	D
AOC9-MW15	T	4	4	0.38	-2	62.5%	No	S
AOC9-MW17	T	4	4	0.21	0	37.5%	No	S
AOC9-MW19	S	2	2	0.00	0	0.0%	No	N/A
G009-MW01	T	4	3	1.04	0	37.5%	No	NT
G009-MW02	T	5	0	0.00	0	40.8%	Yes	ND
1,4-DICHLOROBENZENE								
AOC9-MW06	T	5	0	0.00	0	40.8%	Yes	ND
AOC9-MW14	T	4	4	0.48	-6	95.8%	No	D
AOC9-MW15	T	4	4	0.52	-6	95.8%	No	D
AOC9-MW17	T	4	4	0.33	2	62.5%	No	NT
AOC9-MW19	S	2	2	0.00	0	0.0%	No	N/A
G009-MW01	T	4	0	0.00	0	37.5%	Yes	ND
G009-MW02	T	5	0	0.00	0	40.8%	Yes	ND
CHLOROBENZENE								
AOC9-MW06	T	5	0	0.00	0	40.8%	Yes	ND
AOC9-MW14	T	4	4	0.53	-6	95.8%	No	D
AOC9-MW15	T	4	4	0.55	-6	95.8%	No	D
AOC9-MW17	T	4	4	0.42	2	62.5%	No	NT
AOC9-MW19	S	2	2	0.00	0	0.0%	No	N/A
G009-MW01	T	4	0	0.00	0	37.5%	Yes	ND
G009-MW02	T	5	0	0.00	0	40.8%	Yes	ND
TRICHLOROETHYLENE (TCE)								
AOC9-MW06	T	5	5	0.33	1	50.0%	No	NT
AOC9-MW14	T	4	4	1.37	-3	72.9%	No	NT
AOC9-MW15	T	4	3	0.82	-5	89.6%	No	S
AOC9-MW17	T	4	4	0.20	-3	72.9%	No	S
AOC9-MW19	S	2	2	0.00	0	0.0%	No	N/A
G009-MW01	T	4	3	1.15	-4	83.3%	No	NT
G009-MW02	T	5	4	1.03	-6	88.3%	No	NT

Project: AOC 9

User Name: Jenkins

Location: Griffiss AFB

State: New York

Well	Source/ Tail	Number of Samples	Number of Detects	Coefficient of Variation	Mann-Kendall Statistic	Confidence in Trend	All Samples "ND" ?	Concentration Trend
TRICHLOROETHYLENE (TCE)								

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A)- Due to insufficient Data (< 4 sampling events); Source/Tail (S/T)

The Number of Samples and Number of Detects shown above are post-consolidation values.

MAROS Spatial Moment Analysis Summary

Project: AOC 9

Location: Griffiss AFB

User Name: Jenkins

State: New York

	0th Moment	1st Moment (Center of Mass)			2nd Moment (Spread)		
Effective Date	Estimated Mass (Kg)	Xc (ft)	Yc (ft)	Source Distance (ft)	Sigma XX (sq ft)	Sigma YY (sq ft)	Number of Wells
1,2-DICHLOROBENZENE							
12/18/1997	0.0E+00						2
5/15/2000	0.0E+00						3
9/5/2004	0.0E+00						3
11/1/2006	0.0E+00						4
7/28/2010	7.2E-01	1,133,840	1,181,559	0	4,246	10,747	6
5/17/2011	0.0E+00						5
10/24/2011	0.0E+00						5
1,4-DICHLOROBENZENE							
12/18/1997	0.0E+00						2
5/15/2000	0.0E+00						3
9/5/2004	0.0E+00						3
11/1/2006	0.0E+00						4
7/28/2010	7.4E-01	1,133,833	1,181,574	17	4,604	12,803	6
5/17/2011	0.0E+00						5
10/24/2011	0.0E+00						5
CHLOROBENZENE							
12/18/1997	0.0E+00						2
5/15/2000	0.0E+00						3
9/5/2004	0.0E+00						3
11/1/2006	0.0E+00						4
7/28/2010	5.3E+00	1,133,847	1,181,587	29	3,117	11,265	6
5/17/2011	0.0E+00						5
10/24/2011	0.0E+00						5
TRICHLOROETHYLENE (TCE)							
12/18/1997	0.0E+00						2
5/15/2000	0.0E+00						3
9/5/2004	0.0E+00						3
11/1/2006	0.0E+00						4
7/28/2010	1.2E-01	1,133,822	1,181,554	18	5,937	13,616	6
5/17/2011	0.0E+00						5
10/24/2011	0.0E+00						5

Project: AOC 9

Location: Griffiss AFB

User Name: Jenkins

State: New York

Moment Type	Constituent	Coefficient of Variation	Mann-Kendall S Statistic	Confidence in Trend	Moment Trend
Zeroth Moment: Mass					
	1,2-DICHLOROBENZENE	2.65	2	55.7%	NT
	1,4-DICHLOROBENZENE	2.65	2	55.7%	NT
	CHLOROBENZENE	2.65	2	55.7%	NT
	TRICHLOROETHYLENE (TCE)	2.65	2	55.7%	NT
1st Moment: Distance to Source					
	1,2-DICHLOROBENZENE	0.00	0	0.0%	N/A
	1,4-DICHLOROBENZENE	0.00	0	0.0%	N/A
	CHLOROBENZENE	0.00	0	0.0%	N/A
	TRICHLOROETHYLENE (TCE)	0.00	0	0.0%	N/A
2nd Moment: Sigma XX					
	1,2-DICHLOROBENZENE	0.00	0	0.0%	N/A
	1,4-DICHLOROBENZENE	0.00	0	0.0%	N/A
	CHLOROBENZENE	0.00	0	0.0%	N/A
	TRICHLOROETHYLENE (TCE)	0.00	0	0.0%	N/A
2nd Moment: Sigma YY					
	1,2-DICHLOROBENZENE	0.00	0	0.0%	N/A
	1,4-DICHLOROBENZENE	0.00	0	0.0%	N/A
	CHLOROBENZENE	0.00	0	0.0%	N/A
	TRICHLOROETHYLENE (TCE)	0.00	0	0.0%	N/A

Note: The following assumptions were applied for the calculation of the Zeroth Moment:

Porosity: 0.40 **Saturated Thickness:** Uniform: 20 ft

Mann-Kendall Trend test performed on all sample events for each constituent. Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A)-Due to insufficient Data (< 4 sampling events).

Note: The Sigma XX and Sigma YY components are estimated using the given field coordinate system and then rotated to align with the estimated groundwater flow direction. Moments are not calculated for sample events with less than 6 wells.

MAROS Statistical Trend Analysis Summary

Project: AOC 9

Location: Griffiss AFB

User Name: Jenkins

State: New York

Time Period: 12/18/1997 **to** 10/24/2011

Consolidation Period: No Time Consolidation

Consolidation Type: Median

Duplicate Consolidation: Average

ND Values: Specified Detection Limit

J Flag Values : Actual Value

Well	Source/ Tail	Number of Samples	Number of Detects	Average Conc. (mg/L)	Median Conc. (mg/L)	All Samples "ND" ?	Mann-Kendall Trend	Linear Regression Trend
1,2-DICHLOROBENZENE								
AOC9-MW06	T	5	0	3.0E-03	3.0E-03	Yes	ND	ND
AOC9-MW14	T	4	4	1.0E-01	1.0E-01	No	D	PD
AOC9-MW15	T	4	4	5.4E-02	5.7E-02	No	S	S
AOC9-MW17	T	4	4	5.7E-02	5.8E-02	No	S	S
AOC9-MW19	S	2	2	6.0E-03	6.0E-03	No	N/A	N/A
G009-MW01	T	4	3	1.2E-03	6.8E-04	No	NT	NT
G009-MW02	T	5	0	3.0E-03	3.0E-03	Yes	ND	ND
1,4-DICHLOROBENZENE								
AOC9-MW06	T	5	0	3.0E-03	3.0E-03	Yes	ND	ND
AOC9-MW14	T	4	4	7.1E-02	7.0E-02	No	D	PD
AOC9-MW15	T	4	4	6.5E-02	6.1E-02	No	D	PD
AOC9-MW17	T	4	4	2.6E-02	2.5E-02	No	NT	NT
AOC9-MW19	S	2	2	3.5E-03	3.5E-03	No	N/A	N/A
G009-MW01	T	4	0	3.0E-03	3.0E-03	Yes	ND	ND
G009-MW02	T	5	0	3.0E-03	3.0E-03	Yes	ND	ND
CHLOROBENZENE								
AOC9-MW06	T	5	0	5.0E-03	5.0E-03	Yes	ND	ND
AOC9-MW14	T	4	4	1.1E+00	1.2E+00	No	D	S
AOC9-MW15	T	4	4	1.1E+00	1.1E+00	No	D	S
AOC9-MW17	T	4	4	5.0E-01	5.0E-01	No	NT	NT
AOC9-MW19	S	2	2	1.6E-02	1.6E-02	No	N/A	N/A
G009-MW01	T	4	0	5.0E-03	5.0E-03	Yes	ND	ND
G009-MW02	T	5	0	5.0E-03	5.0E-03	Yes	ND	ND
TRICHLOROETHYLENE (TCE)								
AOC9-MW06	T	5	5	1.1E-03	1.0E-03	No	NT	S
AOC9-MW14	T	4	4	9.2E-03	3.4E-03	No	NT	NT
AOC9-MW15	T	4	3	2.4E-03	2.0E-03	No	S	S
AOC9-MW17	T	4	4	1.5E-02	1.4E-02	No	S	D
AOC9-MW19	S	2	2	5.0E-04	5.0E-04	No	N/A	N/A
G009-MW01	T	4	3	1.8E-03	8.8E-04	No	NT	NT
G009-MW02	T	5	4	1.8E-03	8.8E-04	No	NT	PD

MAROS Statistical Trend Analysis Summary

Well	Source/ Tail	Number of Samples	Number of Detects	Average Conc. (mg/L)	Median Conc. (mg/L)	All Samples "ND" ?	Mann-Kendall Trend	Linear Regression Trend
TRICHLOROETHYLENE (TCE)								

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); No Detectable Concentration (NDC)

The Number of Samples and Number of Detects shown above are post-consolidation values.

MAROS Plume Analysis Summary

Project: AOC 9

Location: Griffiss AFB

User Name: Jenkins

State: New York

Time Period: 12/18/1997 **to** 10/24/2011

Consolidation Period: No Time Consolidation

Consolidation Type: Median

Duplicate Consolidation: Average

ND Values: Specified Detection Limit

J Flag Values : Actual Value

Constituent	Well	Source/ Tail	Number of Samples	Number of Detects	Average (mg/L)	Median (mg/L)	All Samples "ND" ?	Mann-Kendall	Linear Regression	Modeling	Empirical
1,2-DICHLOROBENZENE											
	AOC9-MW06	T	5	0	3.0E-03	3.0E-03	Yes	ND	ND	N/A	N/A
	AOC9-MW14	T	4	4	1.0E-01	1.0E-01	No	D	PD	N/A	N/A
	AOC9-MW15	T	4	4	5.4E-02	5.7E-02	No	S	S	N/A	N/A
	AOC9-MW17	T	4	4	5.7E-02	5.8E-02	No	S	S	N/A	N/A
	AOC9-MW19	S	2	2	6.0E-03	6.0E-03	No	N/A	N/A	N/A	N/A
	G009-MW01	T	4	3	1.2E-03	6.8E-04	No	NT	NT	N/A	N/A
	G009-MW02	T	5	0	3.0E-03	3.0E-03	Yes	ND	ND	N/A	N/A
1,4-DICHLOROBENZENE											
	AOC9-MW06	T	5	0	3.0E-03	3.0E-03	Yes	ND	ND	N/A	N/A
	AOC9-MW14	T	4	4	7.1E-02	7.0E-02	No	D	PD	N/A	N/A
	AOC9-MW15	T	4	4	6.5E-02	6.1E-02	No	D	PD	N/A	N/A
	AOC9-MW17	T	4	4	2.6E-02	2.5E-02	No	NT	NT	N/A	N/A
	AOC9-MW19	S	2	2	3.5E-03	3.5E-03	No	N/A	N/A	N/A	N/A
	G009-MW01	T	4	0	3.0E-03	3.0E-03	Yes	ND	ND	N/A	N/A
	G009-MW02	T	5	0	3.0E-03	3.0E-03	Yes	ND	ND	N/A	N/A
CHLOROBENZENE											
	AOC9-MW06	T	5	0	5.0E-03	5.0E-03	Yes	ND	ND	N/A	N/A
	AOC9-MW14	T	4	4	1.1E+00	1.2E+00	No	D	S	N/A	N/A
	AOC9-MW15	T	4	4	1.1E+00	1.1E+00	No	D	S	N/A	N/A
	AOC9-MW17	T	4	4	5.0E-01	5.0E-01	No	NT	NT	N/A	N/A
	AOC9-MW19	S	2	2	1.6E-02	1.6E-02	No	N/A	N/A	N/A	N/A

Project: AOC 9 **User Name:** Jenkins

Location: Griffiss AFB **State:** New York

Constituent	Well	Source/ Tail	Number of Samples	Number of Detects	Average (mg/L)	Median (mg/L)	All Samples "ND" ?	Mann-Kendall	Linear Regression	Modeling	Empirical
CHLOROBENZENE											
	G009-MW01	T	4	0	5.0E-03	5.0E-03	Yes	ND	ND	N/A	N/A
	G009-MW02	T	5	0	5.0E-03	5.0E-03	Yes	ND	ND	N/A	N/A
TRICHLOROETHYLENE (TCE)											
	AOC9-MW06	T	5	5	1.1E-03	1.0E-03	No	NT	S	N/A	N/A
	AOC9-MW14	T	4	4	9.2E-03	3.4E-03	No	NT	NT	N/A	N/A
	AOC9-MW15	T	4	3	2.4E-03	2.0E-03	No	S	S	N/A	N/A
	AOC9-MW17	T	4	4	1.5E-02	1.4E-02	No	S	D	N/A	N/A
	AOC9-MW19	S	2	2	5.0E-04	5.0E-04	No	N/A	N/A	N/A	N/A
	G009-MW01	T	4	3	1.8E-03	8.8E-04	No	NT	NT	N/A	N/A
	G009-MW02	T	5	4	1.8E-03	8.8E-04	No	NT	PD	N/A	N/A

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); Source/Tail (S/T)

The Number of Samples and Number of Detects shown above are post-consolidation values.

MAROS Spatial Moment Analysis Summary

Project: AOC 9

Location: Griffiss AFB

User Name: Jenkins

State: New York

	0th Moment	1st Moment (Center of Mass)			2nd Moment (Spread)		
Effective Date	Estimated Mass (Kg)	Xc (ft)	Yc (ft)	Source Distance (ft)	Sigma XX (sq ft)	Sigma YY (sq ft)	Number of Wells
1,2-DICHLOROBENZENE							
12/18/1997	0.0E+00						2
5/15/2000	0.0E+00						3
9/5/2004	0.0E+00						3
11/1/2006	0.0E+00						4
7/28/2010	7.2E-01	1,133,840	1,181,559	0	4,246	10,747	6
5/17/2011	0.0E+00						5
10/24/2011	0.0E+00						5
1,4-DICHLOROBENZENE							
12/18/1997	0.0E+00						2
5/15/2000	0.0E+00						3
9/5/2004	0.0E+00						3
11/1/2006	0.0E+00						4
7/28/2010	7.4E-01	1,133,833	1,181,574	17	4,604	12,803	6
5/17/2011	0.0E+00						5
10/24/2011	0.0E+00						5
CHLOROBENZENE							
12/18/1997	0.0E+00						2
5/15/2000	0.0E+00						3
9/5/2004	0.0E+00						3
11/1/2006	0.0E+00						4
7/28/2010	5.3E+00	1,133,847	1,181,587	29	3,117	11,265	6
5/17/2011	0.0E+00						5
10/24/2011	0.0E+00						5
TRICHLOROETHYLENE (TCE)							
12/18/1997	0.0E+00						2
5/15/2000	0.0E+00						3
9/5/2004	0.0E+00						3
11/1/2006	0.0E+00						4
7/28/2010	1.2E-01	1,133,822	1,181,554	18	5,937	13,616	6
5/17/2011	0.0E+00						5
10/24/2011	0.0E+00						5

Project: AOC 9

Location: Griffiss AFB

User Name: Jenkins

State: New York

Moment Type	Constituent	Coefficient of Variation	Mann-Kendall S Statistic	Confidence in Trend	Moment Trend
Zeroth Moment: Mass					
	1,2-DICHLOROBENZENE	2.65	2	55.7%	NT
	1,4-DICHLOROBENZENE	2.65	2	55.7%	NT
	CHLOROBENZENE	2.65	2	55.7%	NT
	TRICHLOROETHYLENE (TCE)	2.65	2	55.7%	NT
1st Moment: Distance to Source					
	1,2-DICHLOROBENZENE	0.00	0	0.0%	N/A
	1,4-DICHLOROBENZENE	0.00	0	0.0%	N/A
	CHLOROBENZENE	0.00	0	0.0%	N/A
	TRICHLOROETHYLENE (TCE)	0.00	0	0.0%	N/A
2nd Moment: Sigma XX					
	1,2-DICHLOROBENZENE	0.00	0	0.0%	N/A
	1,4-DICHLOROBENZENE	0.00	0	0.0%	N/A
	CHLOROBENZENE	0.00	0	0.0%	N/A
	TRICHLOROETHYLENE (TCE)	0.00	0	0.0%	N/A
2nd Moment: Sigma YY					
	1,2-DICHLOROBENZENE	0.00	0	0.0%	N/A
	1,4-DICHLOROBENZENE	0.00	0	0.0%	N/A
	CHLOROBENZENE	0.00	0	0.0%	N/A
	TRICHLOROETHYLENE (TCE)	0.00	0	0.0%	N/A

Note: The following assumptions were applied for the calculation of the Zeroth Moment:

Porosity: 0.40 **Saturated Thickness:** Uniform: 20 ft

Mann-Kendall Trend test performed on all sample events for each constituent. Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A)-Due to insufficient Data (< 4 sampling events).

Note: The Sigma XX and Sigma YY components are estimated using the given field coordinate system and then rotated to align with the estimated groundwater flow direction. Moments are not calculated for sample events with less than 6 wells.