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FINAL INTERIM REMEDIAL ACTION COMPLETION REPORT SITE 10 OPERABLE UNIT 5 (OU 5) ALLEGANY BALLISTICS LABORATORY ROCKET CENTER WV

9/1/2013

CH2M HILL

Final

Interim Remedial Action Completion Report
Site 10, OU-5

Allegany Ballistics Laboratory
Rocket Center, West Virginia

Contract Task Order WE13

September 2013

Prepared for

Department of the Navy
Naval Facilities Engineering Command
Mid-Atlantic Division

Under the
CLEAN 1000 Program
Contract No. N62470-08-D-1000

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Acronyms and Abbreviations

ABL	Allegany Ballistics Laboratory
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Contaminant of Concern
DCE	1,1-dichlorothene
DoD	Department of Defense
EPA	United States Environmental Protection Agency
gpm	Gallon per Minute
HHRA	Human Health Risk Assessment
IRACR	Interim Remedial Action Completion Report
IRP	Installation Restoration Program
LTM	Long-term monitoring
LUC	Land-use Control
MCL	Maximum Contaminant Level
msl	Mean Sea Level
NPL	National Priorities List
OU	Operable Unit
O&M	Operation and Maintenance
PRAP	Proposed Remedial Action Plan
RA	Remedial Action
RAO	Remedial Action Objective
RI	Remedial Investigation
ROD	Record of Decision
TCE	Trichloroethene
VOC	Volatile Organic Compound
WVDEP	West Virginia Department of Environmental Protection

Certification Statement

This Interim Remedial Action Completion Report (IRACR) indicates the groundwater remedy at Site 10 - Former TCE Still at Building 157 (OU-5) is operational and functional in accordance with Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and progress has been made towards achieving all the Remedial Action Objectives (RAOs) identified in the Record of Decision (ROD) (CH2M HILL, 2005a). There is no human exposure to contaminated groundwater and the contamination sources are being reduced. Long-term monitoring (LTM) is ongoing and will continue until RAOs are achieved. Additionally, the protectiveness of the remedy will be reevaluated informally on a continual basis as LTM data are generated and formally during each 5-year Review (next scheduled review is 2018).

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SECTION 1

Overview

This Interim Remedial Action Completion Report (IRACR) documents the remedial action at Site 10 – Former Trichloroethylene (TCE) Still at Building 157 (Operable Unit [OU]-5 Groundwater) at Allegany Ballistics Laboratory (ABL), Rocket Center, West Virginia. This IRACR has been prepared in accordance with the *Department of Defense (DoD) and Environmental Protection Agency (EPA) Joint Guidance, Recommended Streamlined Site Closeout and National Priorities List (NPL) Deletion Process for DoD Facilities* (DoD and EPA, 2006).

1.1 Facility Background

ABL consists of about 1,634 acres of land with about 350 buildings located in Mineral County, West Virginia, approximately 10 miles southwest of Cumberland, Maryland along the West Virginia and Maryland border. The facility lies between the North Branch Potomac River, to the north and west, and Knobly Mountain, to the south and east. Since 1943, ABL has been used primarily for research, development, production, and testing of solid propellants and motors for ammunition, rockets, and armaments. The land area at ABL is divided into two distinct operating plants. Plant 1, which occupies about 1,577 acres (including a large undeveloped area), is owned by the Navy and leased to its operator, ATK Tactical Systems Company, LLC. Plant 2, which occupies the remaining 57 acres, is both owned and operated by ATK. ABL Plant 1 was identified as a Federal Facility on EPA's National Priorities List (NPL) Site on May 11, 1994. A Federal Facilities Agreement for ABL was finalized between the Navy, EPA Region III, and the West Virginia Department of Environmental Protection (WVDEP) in January 1998. Site 10 is one of several Installation Restoration Program (IRP) sites being addressed under Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) at ABL (**Figure 1-1**).

1.2 Site Background

Site 10 is approximately 8 acres and is located in the south-central area of the developed portion of Plant 1, approximately 2,000 feet from North Branch Potomac River (**Figure 1-2**). The site is relatively flat, with land elevations between about 665 feet mean sea level (msl) and 671 feet msl. The majority of the site is grass-covered, but a significant portion is covered by ABL facility buildings and roads.

Site 10 comprises the area that includes the former TCE still at Building 157, former Production Well A, and former Production Well C, where contamination has been found and attributed to the historic activities at Building 157 involving distillation of used degreasing solvents.

Building 157 was constructed in the 1950s as a chamber preparation building for the A2 Polaris second stage rocket motor casing. TCE use at the building involved a solvent recovery still just outside the southeast side of the building, where TCE was recovered by distilling. TCE use and storage at Building 157 began about 1960, but ceased in the early 1960s (facility-wide use of TCE at ABL was discontinued in the early 1990s). It has been determined that the TCE from the distilling activities is the likely source of the contamination detected in groundwater at Site 10.

Investigations were conducted at Site 10 to evaluate the extent of groundwater contamination at the site. Based on the investigations, contamination was determined to be limited to volatile organic compounds (VOCs) in the alluvial and bedrock aquifers. The human health risk assessment (HHRA) conducted during the Phase II Remedial Investigation (RI) identified potentially unacceptable human health risks to future residents with TCE as one of the primary risk drivers. The HHRA identified TCE; tetrachlorethene; 1,1-dichlorethene (DCE); and 1,2-DCE (total) as chemicals of potential concern. Therefore, it was necessary to evaluate potential remedial alternatives for addressing the contamination in a feasibility study. Before the alternatives could be evaluated, the full extent of contamination (in both the alluvial and bedrock aquifers) and the aquifer characteristics that would influence the effectiveness of any remedial alternative was determined. Aquifer Testing was conducted in 1995 and 1996 and concluded that aquifer characteristics were not uniform, but changed in an eastward direction across Site 10.

A Focused Feasibility Study for groundwater was completed in 1998 to evaluate remedial action alternatives to address VOCs in the groundwater at Site 10. On August 27, 1998 an interim remedial action Record of Decision (ROD) was signed by the Navy, EPA, and WVDEP and involved groundwater extraction from the alluvial aquifer and treatment at the Site 1 groundwater treatment plant (CH2M HILL, 1998). The purpose of the interim remedial action was to prevent continued movement of the most highly contaminated portion of the groundwater at Site 10 (referred to as the “hot spot”) while other remedial alternatives were evaluated for the rest of the groundwater contamination at the site. The groundwater extraction and treatment system began pumping in February 1999.

A Proposed Remedial Action Plan (PRAP) was completed on January 28, 2002 and the final ROD was signed September 15, 2005 (CH2M HILL, 2005a) to document the selected remedy for contaminants of concern (COC) in groundwater. The final selected remedy documented in the ROD consisted of expanded groundwater extraction from the alluvial and bedrock aquifers and treatment at the Site 1 groundwater treatment plant. The remedy is intended to contain and remove the most highly contaminated portion of the alluvial aquifer and avoid further downgradient contamination.

1.3 Community Involvement

The PRAP was issued to invite public participation in the remedial alternative selection process for Site 10 groundwater and to fulfill the public participation requirement established under Section 117(a) of CERCLA and Section 300.430(f)(2) & (3) of National Oil Hazardous Substances Pollution Contingency Plan. The PRAP, along with other key documents such as the Focused Feasibility Study, were made available for review at the LaVale Public Library in Maryland and Fort Ashby Public Library in West Virginia. The notice of availability of the PRAP and the public meeting was published in two local newspapers. A public meeting was held on February 13, 2002 to explain the PRAP and to address public comments. Verbal questions and comments were received during the Public Meeting and written comments received during the public comment period were reviewed and responses were put in the ROD (CH2M HILL, 2005a).

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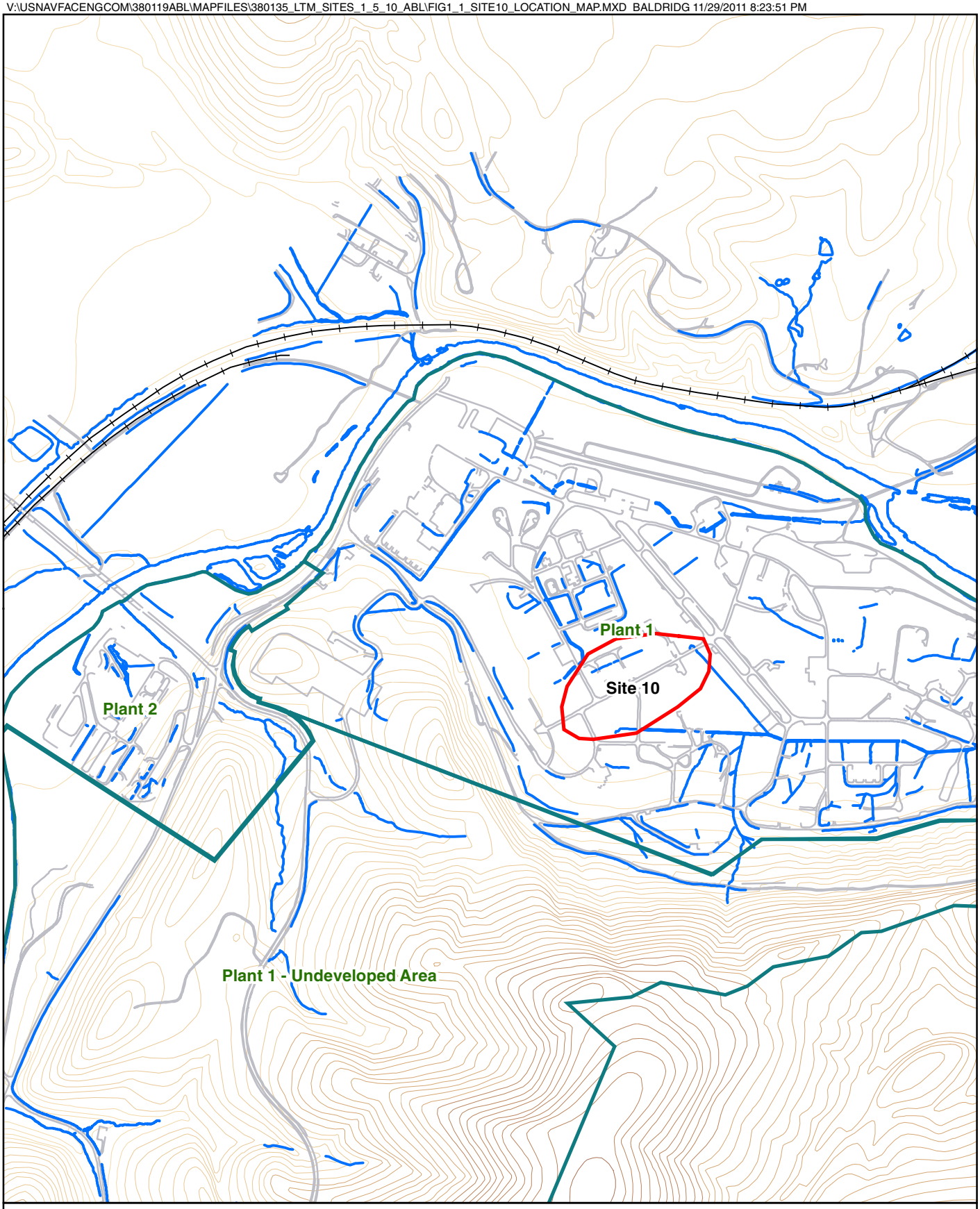

Legend
- Elevation Contours
- Water Bodies
- Paved Roads
- Rail Roads
- IR Sites
- Activity Boundary

N

0 250 500 1,000 Feet

1 inch = 1,000 feet

Figure 1-1
Site Location Map
Interim Remedial Action Completion Report Site 10, OU-5
Allegany Ballistics Laboratory
Rocket Center, West Virginia

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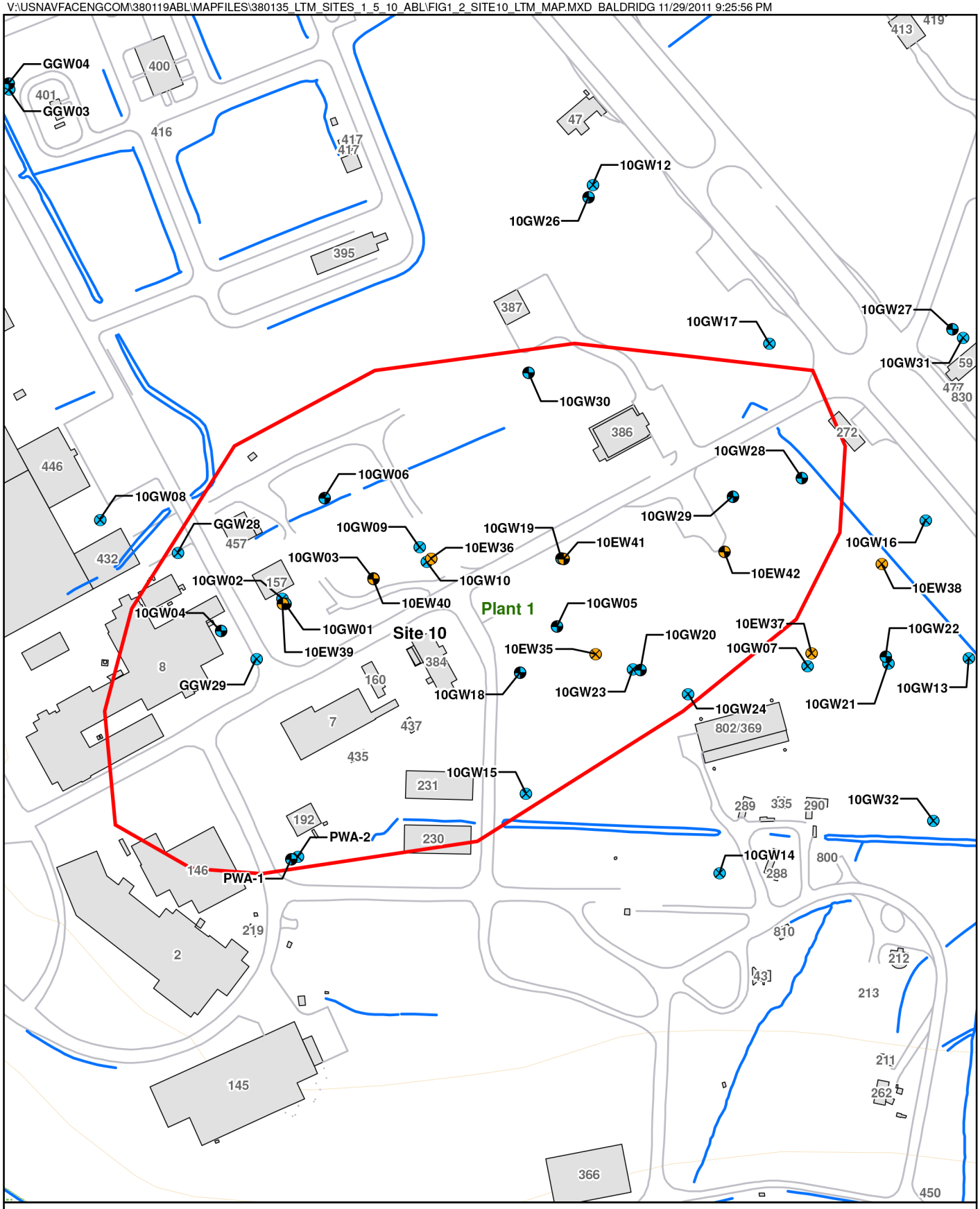

Legend

- Extraction Well - Alluvial
- Extraction Well - Bedrock
- Monitoring Well - Bedrock
- Monitroing Well - Alluvial
- Water Bodies
- Elevation Contours
- Paved Roads
- IR Sites
- Activity Boundary
- Structures

N

0 50 100 200 Feet

1 inch = 200 feet

Figure 1-2
Site 10 Long Term Monitoring Locations
Interim Remedial Action Completion Report Site 10, OU-5
Allegany Ballistics Laboratory
Rocket Center, West Virginia

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SECTION 2

Remedial Action Objectives

As presented in the HHRA for Site 10 OU-5, the need for remedial action was identified for alluvial and bedrock aquifer groundwater due to potentially unacceptable human health risks to future residents and construction workers due to the levels of VOCs, with TCE as the primary risk drivers (CH2M HILL, 1996). To address these risks, the following Remedial Action Objectives (RAOs) were established for Site 10:

- Prevent or minimize exposure of potential future on-site residents and construction workers to contaminated groundwater originating from Site 10.
- Achieve the chemical-specific Maximum Contaminant Levels (MCLs), where practical. The list of MCL cleanup goals for the chemicals of potential concern in the Site 10 alluvial and bedrock aquifers is presented in **Table 2-1** below.

TABLE 2-1
MCLs for Site 10 Groundwater Chemicals of Potential Concern (COPC): Future Residential Scenario
Interim Remedial Action Completion Report, Site 10, OU-5
Allegany Ballistics Laboratory
Rocket Center, West Virginia

Exposure Point	Chemical of Potential Concern	MCL (micrograms per liter)
Groundwater - Alluvial	1,2-Dichloroethene (total)	25
	Methylene Chloride	5
	Tetrachloroethene	5
	Trichloroethene	5
	Arsenic	10
	Manganese	No Criteria
Groundwater - Bedrock	1,1-Dichloroethene	7
	1,2-Dichloroethene (total)	25
	Methylene Chloride	5
	Tetrachloroethene	5
	Trichloroethene	5
	Arsenic	10
	Manganese	No Criteria

SECTION 3

Remedial Action

3.1 Selected Remedy

Groundwater contamination at Site 10 was initially addressed through an Interim ROD, signed on August 27, 1998 and involved groundwater extraction from the alluvial aquifer and treatment at the Site 1 groundwater treatment plant (CH2M HILL, 1998). The interim remedy was intended to contain and remove the most highly contaminated portion of the alluvial aquifer and avoid further downgradient contamination, while additional Remedial Actions (RAs) were considered to address the broader area of groundwater contamination.

Following an evaluation period of the effectiveness of alluvial groundwater extraction under the Interim ROD, an expansion of the extraction system was completed in February 2003, including the installation of four bedrock extraction wells. The Final ROD for Site 10 OU-5 was signed on September 15, 2005 (CH2M HILL, 2005a). The selected remedy included this expanded extraction and treatment system.

Long-term monitoring groundwater data has been collected at the prescribed intervals following the system start-up and in accordance with the *Final Long-Term Monitoring (LTM) Plan for Sites 1, 5, and 10* (CH2M HILL, 2006). Land-use controls (LUCs) are in place in order to prevent or minimize exposure of potential future on-site residents and construction workers to contaminated groundwater (CH2MHILL, 2013a). Institutional controls in place to prevent on-site use of untreated groundwater include limited access via facility security and Site 10 boundary identification in the Navy Geographic Information Systems database. Visual site inspections are conducted quarterly, which include inspection of existing site fencing and other security measures, condition of wells, and monitoring current site activities for evidence that may indicate groundwater use. The institutional controls are being implemented through the *Final Construction, Excavation and Groundwater Use Restriction Plan for Installation Restoration Program (IRP) Sites* (CH2M HILL, 2005b).

The major activities associated with the remedial action for Site 10 OU-5 include:

- Extraction of groundwater using an alluvial and bedrock extraction well network to remove contaminated groundwater from both the alluvial and bedrock aquifers.
- Piping the extracted groundwater to the Site 1 groundwater treatment plant for treatment using air stripping.
- Discharge of the treated groundwater to the North Branch Potomac River. Waste stream sampling is conducted before and after treatment to ensure that the effluent concentrations do not exceed discharge limits established by the WVDEP. A portion of the treated groundwater is utilized by the ABL facility, on an as needed basis, for steam generation.
- LTM to evaluate alluvial and bedrock groundwater quality, contaminant migration, and remedial system performance for inclusion in 5-year reviews.
- Groundwater use restrictions imposed through appropriate administrative mechanisms until the RAOs for Site 10 OU-5 are achieved.

3.2 Groundwater Extraction and Treatment

The groundwater extraction system at Site 10 initially consisted of a network of three alluvial extraction wells, which began operation in February 1999. The extraction system was expanded in July 2000 to include one additional alluvial extraction well.

In July 2001, as part of the Phase III Aquifer Testing, it was concluded that drawdown from the Site 1 bedrock extraction network was drawing Site 10 groundwater down into the bedrock, thereby affecting the efficiency of the Site 10 alluvial extraction network. In February 2003, the extraction system was expanded to include four bedrock extraction wells to overcome the Site 1 influence.

Groundwater is pumped from the four alluvial extraction wells and four bedrock extraction wells and transported via pipeline to the Site 1 groundwater treatment plant, which currently treats groundwater from Site 1 and Site 10. The treatment plant began continuous operation in September 1998 and has treated an average of 121 gallons per minute (gpm) of groundwater since that time, with approximately 80% of groundwater pumped to the treatment plant coming from Site 1 and approximately 20% from Site 10. The treated groundwater is either utilized by the ABL boiler plant or discharged to the North Branch Potomac River. The portion of water utilized by the boiler plant varies with seasonal change and operations at ABL, and excess water being discharged to the North Branch Potomac River.

3.3 Long-Term Monitoring

In order to evaluate the effectiveness of the remedial action, performance monitoring is conducted on a tri-quarterly basis. LTM, which began in January 1999, is ongoing and will continue until the RAOs have been achieved. The major components of the long-term monitoring at Site 10 OU-5 consist of the following items (**Figure 1-2**):

- **Groundwater Hydraulic Head Monitoring** – Water level measurements are collected from alluvial and bedrock extraction and monitoring wells in order to evaluate the effectiveness of the system to hydraulically contain contaminated portions of the alluvial and bedrock aquifers in order to prevent further migration of contaminated groundwater. Potentiometric surface contour maps are prepared each month using the monitoring data collected to demonstrate groundwater capture. Measurements are collected manually on a monthly basis and prior to each groundwater LTM sampling event.

- **Groundwater Sampling** – Groundwater samples are collected in the alluvial and bedrock aquifers in order to assess whether the groundwater extraction and treatment system is meeting the goal of restoring the aquifers to beneficial use as potential drinking water sources. Groundwater sampling is performed on a tri-quarterly (i.e., every 9 months) basis in five alluvial monitoring wells (10GW12, 10GW15, 10GW16, 10GW23, and 2GW03), four alluvial extraction wells (10EW35, 10EW36, 10EW37, 10EW38), four bedrock monitoring wells (10GW06, 10GW20, 10GW29, and 10GW30) and four bedrock extraction wells (10EW39, 10EW40, 10EW41, and 10EW42. Prior to each 5-Year ROD Review, an expanded set of wells are sampled for the 5-Year ROD Review. The expanded list includes the monitoring and extraction wells included in the tri-quarterly events, plus six additional alluvial wells (10GW02, 10GW07, 10GW08, 10GW21, 10GW31, and PWA-2) and four additional bedrock wells (10GW22, 10GW27, 10GW28, and PWA-1). Groundwater samples are analyzed for VOCs. Since 2003 the TCE concentrations at Site 10 have been relatively stable with a slight overall decreasing trend. **Tables 3-1 and 3-2** present the results for each long-term monitoring event. **Figures 3-1** and **3-2** present a time series of the TCE contaminant plume in the alluvial and bedrock aquifers, respectively. The data for the most recent monitoring event in October 2011 have not been verified, therefore, have not been included in this assessment.

TCE is the primary COC in alluvial groundwater at the site and best represents the VOC distribution in the alluvial groundwater. **Figure 3-3** presents the time-series TCE concentrations for alluvial aquifer wells 10GW12, 10GW15, 10EW36, and 10GW23. Other than a sharp decline (i.e., about an order of magnitude) in the TCE concentration in well 10GW23 between the baseline event in 1999 and the resumption of monitoring of this well in 2006, the TCE concentrations in all of these wells have been relatively stable since 2000. Well 10EW36 was not sampled during the January reporting period because the well motor was out of service. According to archived system files, 10EW36 ceased operation on November 14, 2010, and resumed operation beginning on January 19, 2011 after a replacement pump could be obtained.

Like the alluvial aquifer, TCE is the primary COC detected in the Site 10 bedrock aquifer and best represents the VOC distribution in the bedrock aquifer. Currently, the highest TCE concentration is located at 10EW40 (65.2 µg/L for January 2011). While there are gaps in sampling data at 10EW40, it shows an overall decreasing trend, although the most recent results exceed the TCE MCL. 10EW40 was out of service due to pump malfunction

during the August 2006 sampling event, and could not be sampled. **Figure 3-4** presents the time-series TCE concentrations for bedrock wells 10EW40, 10GW06, 10GW20, and 10GW29.

3.4 Land Use Controls

LUCs are currently maintained within the area of restricted groundwater use at Site 10 and are inspected on a quarterly basis. Institutional controls have been implemented for Site 10 OU-5 groundwater to meet the following LUC Objectives:

- Ensure no extraction of groundwater from Site 10 except for purposes of transport to Site 1 for treatment (including no extraction of groundwater for use as drinking water) in the restricted area, shown on **Figure 1-2**, until the RAOs for OU-5 are met and risks from groundwater use are shown to be reduced to acceptable levels to allow for unrestricted use and exposure.
- Ensure adequate protection to minimize potentially adverse health and environmental effects of work or development in the restricted area.
- Ensure adequate protection to maintain the integrity of any current or future remedial equipment or monitoring operation in the restricted area.

The LUC Remedial Design was finalized in May 2013 and prohibits the extraction and use of onsite groundwater at Site 10 (except for transport to the Site 1 GWTP). Additionally, the LUC Remedial Design outlines the implementation actions that will be conducted in order to maintain the LUC objectives (CH2M HILL, 2013a). A comprehensive list of LUCs with associated boundaries and expected durations is retained at the ABL facility and is implemented through the *Final Construction, Excavation and Groundwater Use Restriction Plan for Installation Restoration Program Sites* (CH2M HILL, 2005b).

Table 3-1
Groundwater Detected Analytical Results from Triquarterly Monitoring Well Network: 2003 to 2011
Interim Remedial Action Completion Report, Site 10, OU-5
Allegany Ballistics Laboratory
Rocket Center, West Virginia

Station ID	10EW35								10EW35				
Sample ID	AS10-10EW35-R07	AS10-10EW35-R08	AS10-10EW35-R09	AS10-10EW35-R10	AS10-10EW35-R11	AS10-10EW35-R12	AS10-10EW35-R13	AS10-10EW35-R14	AS10-10EW35-R15	AS10-10EW35-R16	AS10-10EW35-R17	AS10-10EW35P-R18	AS10-10EW35-R18
Sample Date	07/22/03	04/14/04	01/19/05	10/25/05	08/10/06	04/18/07	01/28/08	10/16/08	07/22/09	04/22/10	01/15/11	10/12/11	10/12/11
Chemical Name													
Volatile Organic Compounds (UG/L)													
1,1,1-Trichloroethane	1.6	1.4	2.1	1.7	10 U	10 UJ	10 U	5 U	0.48 J	0.647 J	0.783 J	0.642 J	0.63 J
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	38	22	73 J	60 L	40	33 J	43	55	22	28.2	33.4	24.9	25.1
1,1-Dichloroethane	0.5 U	0.5 U	0.42 J	0.5 U	10 U	10 UJ	10 U	5 U	1 U	5 U	0.161 J	0.5 U	0.5 U
1,1-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 UJ	10 U	5 U	1 U	5 U	0.5 U	0.5 U	0.5 U
1,2,3-Trichlorobenzene	0.5 U	0.5 U	0.5 U	0.43 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA	10 UJ	1 J	NA	NA	NA	NA	NA	NA
2-Hexanone	50 R	5 U	5 U	5 U	10 U	10 UJ	10 U	5 U	5 U	5 U	2.5 U	2.5 U	2.5 U
4-Methyl-2-pentanone	5 U	5 U	5 U	5 U	10 U	10 UJ	10 U	5 U	5 U	5 U	2.5 U	2.5 U	2.5 U
Acetone	50 R	5 U	5 U	5 UL	10 UJ	10 UJ	10 U	20 U	5 U	10 R	2.5 R	5 U	5 U
Bromodichloromethane	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 UJ	10 U	5 U	1 U	5 U	0.25 U	0.5 U	0.5 U
Carbon disulfide	3.7 B	0.5 U	13 B	0.5 U	10 U	10 UJ	10 U	5 U	1 U	5 U	0.5 U	0.5 U	0.5 U
Carbon tetrachloride	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 UJ	10 U	5 U	1 U	5 U	0.25 U	0.5 U	0.5 U
Chlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 UJ	10 U	5 U	1 U	5 U	0.125 U	0.5 U	0.5 U
Chloroform	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 UJ	10 U	5 U	1 U	5 U	0.129 B	0.5 U	0.5 U
Chloromethane	0.5 U	0.35 J	0.5 UJ	0.5 U	10 U	10 UJ	10 U	5 U	1 U	5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	1.5	2	3.1	2.9	10 U	10 UJ	1 J	1.9 J	1.2	1.54 J	4.31 J	1.94	2.01
Dichlorodifluoromethane (Freon-12)	0.5 U	0.5 U	0.5 U	0.63	10 U	10 UJ	10 U	5 U	1 U	5 U	0.25 U	1 U	1 U
Methylene chloride	0.73 B	0.5 U	1.3 B	6.3 L	10 U	10 UJ	10 U	5 U	1 U	0.268 B	0.25 U	1 U	1 U
Tetrachloroethene	3.4	2.7	3.9	4.4	2 J	3 J	3 J	2.4 J	2.3	2.44 J	2.89 J	2.61	2.52
Toluene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 UJ	10 U	5 U	1 U	5 U	0.25 U	0.5 U	0.5 U
trans-1,2-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 UJ	10 U	5 U	1 U	5 U	0.25 U	0.5 U	0.5 U
Trichloroethene	41 K	26	31 J	36 L	24	26 J	27	33	18	23.6	23.6	22.5	22.3
Trichlorofluoromethane (Freon-11)	1	0.52	1.4	0.61	10 U	10 UJ	10 U	5 U	0.4 J	0.522 J	0.706 J	1 U	1 U
Vinyl chloride	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 UJ	10 U	5 U	1 U	2 U	0.25 U	0.5 U	0.5 U
Total Metals (UG/L)													
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dissolved Metals (UG/L)													
Aluminum, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

\\orion\Proj\CLEANII\BASES\ABL\CTO-32\Site 5 and 10 IRACR\Site 10 RACR\Final\Tables\[ABL_Site 10_Table 3.1 Detects.xls], mmorri13, 02/18/2014

Notes:

Shading indicates detections

NA - Not analyzed

B - Analyte not detected above the level reported in blanks

J - Analyte present, value may or may not be accurate or precise

K - Analyte present, value may be biased high, actual value may be lower

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R - Unreliable Result

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UG/L - Micrograms per liter

Table 3-1
Groundwater Detected Analytical Results from Triquarterly Monitoring Well Network: 2003 to 2011
Interim Remedial Action Completion Report, Site 10, OU-5
Allegany Ballistics Laboratory
Rocket Center, West Virginia

Station ID	10EW36								10EW36			
Sample ID	AS10-10EW36P-R07	AS10-10EW36-R07	AS10-10EW36-R08	AS10-10EW36-R09	AS10-10EW36-R10	AS10-10EW36-R11	AS10-10EW36-R12	AS10-10EW36-R13	AS10-10EW36-R14	AS10-10EW36-R15	AS10-10EW36-R16	AS10-10EW36-R18
Sample Date	07/22/03	07/22/03	04/14/04	01/19/05	10/25/05	08/10/06	04/18/07	01/28/08	10/16/08	07/22/09	04/22/10	10/12/11
Chemical Name												
Volatile Organic Compounds (UG/L)												
1,1,1-Trichloroethane	3.6	3.7	1.9	3.3	3.7	2 J	2 J	2 J	1.9 J	1.4 J	1.29 J	0.5 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	8.4	10	5.7	19 J	7.5 J	5 J	6 J	5 J	7.1	2.3 J	2.61 J	7.01
1,1-Dichloroethane	0.5 U	0.5 U	0.5 U	0.61	1.1	10 U	10 U	10 U	5 U	4 UJ	0.212 J	0.5 U
1,1-Dichloroethene	0.87	0.98	0.5 U	3.5	1.8	10 U	10 U	10 U	5 U	4 UJ	5 U	0.5 U
1,2,3-Trichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA	NA	31	33	NA	NA	NA	NA
2-Hexanone	130 R	130 R	5 U	5 U	5 U	10 U	10 U	10 U	5 U	20 UJ	5 U	2.5 U
4-Methyl-2-pentanone	5 U	5 U	5 U	5 U	5 U	10 U	10 U	10 U	5 U	20 UJ	5 U	2.5 U
Acetone	130 R	130 R	5 U	5 U	5 UL	10 U	10 U	10 U	20 U	20 UJ	10 R	5 U
Bromodichloromethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	4 UJ	5 U	0.5 U
Carbon disulfide	3.4 B	2.2 B	0.5 U	23 B	0.5 U	10 U	10 U	10 U	5 U	4 UJ	5 U	0.5 U
Carbon tetrachloride	0.36 J	0.35 J	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	4 UJ	5 U	0.5 U
Chlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	0.59 J	4 UJ	5 U	0.5 U
Chloroform	0.64	0.75	0.5 U	0.5 U	0.83	10 U	10 U	10 U	5 U	4 UJ	0.127 J	0.5 U
Chloromethane	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	10 U	10 U	10 U	5 U	4 UJ	5 U	0.5 U
cis-1,2-Dichloroethene	32	32	28	46 J	50 L	25	31	33	29	29 J	24.3	0.5 U
Dichlorodifluoromethane (Freon-12)	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	4 UJ	5 U	1 U
Methylene chloride	0.75 B	0.92 B	0.5 U	0.99 B	5.2 L	1 B	10 U	10 U	5 U	4 UJ	0.467 B	1 U
Tetrachloroethene	2.7 B	2.8 B	1.4	2.6	2.7 J	1 J	2 J	3 J	2.3 J	1.6 J	2.63 J	0.5 U
Toluene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	4 UJ	5 U	0.5 U
trans-1,2-Dichloroethene	1.1	1.3	1.1	2.4	0.99	10 U	10 U	10 U	5 U	4 UJ	0.693 J	0.5 U
Trichloroethene	160 K	150 K	100	110 J	99 L	76	87	71	61	49 J	61.8	2.19
Trichlorofluoromethane (Freon-11)	1.6	1.9	0.96	4	1.8	3 J	2 J	2 J	1.4 J	4 UJ	1.04 J	1 U
Vinyl chloride	0.34 J	0.37 J	0.37 J	0.5 U	0.5 U	10 U	10 U	10 U	5 U	4 UJ	0.632 J	0.5 U
Total Metals (UG/L)												
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dissolved Metals (UG/L)												
Aluminum, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Notes:

Shading indicates detections

NA - Not analyzed

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UG/L - Micrograms per liter

Table 3-1
Groundwater Detected Analytical Results from Triquarterly Monitoring Well Network: 2003 to 2011
Interim Remedial Action Completion Report, Site 10, OU-5
Allegany Ballistics Laboratory
Rocket Center, West Virginia

Station ID	10EW37								10EW37				
Sample ID	AS10-10EW37-R07	AS10-10EW37-R08	AS10-10EW37-R09	AS10-10EW37-R10	AS10-10EW37-R11	AS10-10EW37P-R12	AS10-10EW37-R12	AS10-10EW37-R13	AS10-10EW37-R14	AS10-10EW37-R15	AS10-10EW37-R16	AS10-10EW37-R17	AS10-10EW37-R18
Sample Date	07/22/03	04/14/04	01/19/05	10/25/05	08/10/06	04/18/07	04/18/07	01/28/08	10/16/08	07/22/09	04/22/10	01/15/11	10/12/11
Chemical Name													
Volatile Organic Compounds (UG/L)													
1,1,1-Trichloroethane	0.33 J	0.5 U	0.56	0.5 U	10 U	10 UJ	10 UJ	10 U	500 U	100 U	0.356 J	0.25 U	0.5 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	2,100	880 J	3,200 J	2,200 L	610	950 J	940	1,300	9,100	1,800	323	6,800	894
1,1-Dichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 UJ	10 UJ	10 U	500 U	100 U	5 U	0.125 U	0.5 U
1,1-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 UJ	10 UJ	10 U	500 U	100 U	5 U	0.5 U	0.5 U
1,2,3-Trichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA	10 UJ	10 UJ	10 U	NA	NA	NA	NA	NA
2-Hexanone	1,300 R	5 U	5 U	5 U	10 U	10 UJ	10 UJ	10 U	500 U	500 U	5 U	2.5 U	2.5 U
4-Methyl-2-pentanone	5 U	5 U	5 U	5 U	10 U	10 UJ	10 UJ	10 U	500 U	500 U	5 U	2.5 U	2.5 U
Acetone	1,300 R	5 U	5 U	5 UL	10 UJ	10 UJ	10 UJ	10 U	2,000 U	500 U	10 R	2.5 R	5 U
Bromodichloromethane	1.5	0.5 U	0.5 U	0.5 U	10 U	10 UJ	10 UJ	10 U	500 U	100 U	5 U	0.25 U	0.5 U
Carbon disulfide	0.58 B	0.5 U	0.5 UJ	0.5 U	10 U	10 UJ	10 UJ	10 U	500 U	100 U	5 U	0.5 U	0.5 U
Carbon tetrachloride	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 UJ	10 UJ	10 U	500 U	100 U	5 U	0.25 U	0.5 U
Chlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 UJ	10 UJ	10 U	500 U	100 U	5 U	0.125 U	0.5 U
Chloroform	0.47 J	0.5 U	0.5 U	0.5 U	10 U	10 UJ	10 UJ	10 U	500 U	100 U	0.234 J	0.199 B	0.5 U
Chloromethane	0.5 U	0.38 J	0.5 UJ	0.5 U	10 U	10 UJ	10 UJ	10 U	500 U	100 U	5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	0.68	0.54	0.86	0.48 L	10 U	10 UJ	10 UJ	10 U	500 U	100 U	0.565 J	1.03 J	0.944 J
Dichlorodifluoromethane (Freon-12)	0.5 U	6.4	0.5 U	32 J	10 U	10 UJ	10 UJ	10 U	500 U	100 U	5 U	0.25 U	16.3
Methylene chloride	0.65 B	1.2 B	0.5 UJ	89 L	1 B	10 UJ	10 UJ	10 U	500 U	36 J	0.265 B	0.25 U	1 U
Tetrachloroethene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 UJ	10 UJ	10 U	500 U	100 U	0.322 J	0.25 U	0.362 J
Toluene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 UJ	10 UJ	10 U	500 U	100 U	5 U	0.25 U	0.5 U
trans-1,2-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 UL	10 U	10 UJ	10 UJ	10 U	500 U	100 U	5 U	0.25 U	0.5 U
Trichloroethene	21 J	11	22	5.8	2 J	10 J	10 J	10	500 U	100 U	17.9	8.87	12.7
Trichlorofluoromethane (Freon-11)	1.1	0.51	2.1	0.5 U	10 U	10 UJ	10 UJ	10 U	500 U	100 U	1.32 J	0.815 J	0.864 J
Vinyl chloride	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 UJ	10 UJ	10 U	500 U	100 U	2 U	0.25 U	0.5 U
Total Metals (UG/L)													
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dissolved Metals (UG/L)													
Aluminum, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Notes:

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Table 3-1
Groundwater Detected Analytical Results from Triquarterly Monitoring Well Network: 2003 to 2011
Interim Remedial Action Completion Report, Site 10, OU-5
Allegany Ballistics Laboratory
Rocket Center, West Virginia

Station ID	10EW38								10EW38			
Sample ID	AS10-10EW38-R07	AS10-10EW38-R08	AS10-10EW38-R09	AS10-10EW38-R10	AS10-10EW38-R11	AS10-10EW38-R12	AS10-10EW38-R13	AS10-10EW38-R14	AS10-10EW38-R15	AS10-10EW38-R16	AS10-10EW38-R17	AS10-10EW38-R18
Sample Date	07/22/03	04/14/04	01/19/05	10/25/05	08/29/06	04/18/07	01/28/08	10/16/08	07/22/09	04/22/10	01/15/11	10/12/11
Chemical Name												
Volatile Organic Compounds (UG/L)												
1,1,1-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	0.25 U	1.14
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	6.8	14	110 J	11	58	49	44	120	14	4.56 J	162	3.3
1,1-Dichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	0.125 U	0.5 U
1,1-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	0.5 U	0.492 J
1,2,3-Trichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA	10 U	10 U	NA	NA	NA	NA	NA
2-Hexanone	5 R	5 U	5 U	5 U	10 U	10 U	10 U	5 U	5 U	5 U	2.5 U	2.5 U
4-Methyl-2-pentanone	5 U	5 U	5 U	5 U	10 U	10 U	10 U	5 U	5 U	5 U	2.5 U	2.5 U
Acetone	5 R	5 U	5 U	5 UL	10 UJ	3 B	10 U	20 U	5 U	10 R	2.5 R	5 U
Bromodichloromethane	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	0.25 U	0.5 U
Carbon disulfide	0.82 B	0.5 U	0.5 UJ	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	0.5 U	0.5 U
Carbon tetrachloride	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	0.25 U	0.5 U
Chlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	0.125 U	0.5 U
Chloroform	0.78	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	0.162 B	0.5 U
Chloromethane	0.5 U	0.5 U	0.5 UJ	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 UL	10 U	10 U	10 U	5 U	1 U	5 U	0.252 J	29.1
Dichlorodifluoromethane (Freon-12)	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	0.25 U	1 U
Methylene chloride	0.6 B	0.5 U	1.2 B	0.5 U	10 U	10 U	10 U	5 U	1 U	0.43 B	0.25 U	1 U
Tetrachloroethene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	0.25 U	2.55
Toluene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	0.25 U	0.5 U
trans-1,2-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 UL	10 U	10 U	10 U	5 U	1 U	5 U	0.25 U	0.707 J
Trichloroethene	4.5	2.6	4.3	3.3	3 J	2 J	3 J	5.9	2.4	1.83 J	4.77 J	69.2
Trichlorofluoromethane (Freon-11)	0.4 J	0.5 U	0.58	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	0.626 J	0.862 J
Vinyl chloride	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	1 U	2 U	0.25 U	0.447 J
Total Metals (UG/L)												
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dissolved Metals (UG/L)												
Aluminum, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Notes:

Shading indicates detections

NA - Not analyzed

B - Analyte not detected above the level reported in blanks

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UJ - Analyte not detected, quantitation limit may be inaccurate

UL - Analyte not detected, quantitation limit is probably higher

UG/L - Micrograms per liter

Table 3-1
Groundwater Detected Analytical Results from Triquarterly Monitoring Well Network: 2003 to 2011
Interim Remedial Action Completion Report, Site 10, OU-5
Allegany Ballistics Laboratory
Rocket Center, West Virginia

Station ID	10EW39								10EW39			
Sample ID	AS10-10EW39-R07	AS10-10EW39-R08	AS10-10EW39-R09	AS10-10EW39-R10	AS10-10EW39-R11	AS10-10EW39-R12	AS10-10EW39-R13	AS10-10EW39-R14	AS10-10EW39-R15	AS10-10EW39P-R16	AS10-10EW39-R16	AS10-10EW39-R17
Sample Date	07/22/03	04/14/04	01/19/05	10/25/05	08/10/06	04/18/07	01/28/08	10/16/08	07/22/09	04/22/10	04/22/10	01/15/11
Chemical Name												
Volatile Organic Compounds (UG/L)												
1,1,1-Trichloroethane	2.6	1.7	3	1.8	10 U	10 U	2 J	5 U	0.6 J	0.987 J	0.892 J	0.614 J
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	2.8	1.6	12	4 J	2 J	2 J	2 J	4.7 J	1.2	5 U	5 U	2 U
1,1-Dichloroethane	0.5 J	0.54	1.2	0.81	10 U	10 U	10 U	5 U	0.37 J	0.394 J	0.369 J	0.352 J
1,1-Dichloroethene	1.1	0.85	5.8	1.4	10 U	10 U	1 J	1.1 J	0.45 J	0.635 J	0.644 J	0.659 J
1,2,3-Trichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA	16	20	NA	NA	NA	NA	NA
2-Hexanone	50 R	5 U	5 U	5 U	10 U	10 U	10 U	5 U	5 U	5 U	5 U	2.5 U
4-Methyl-2-pentanone	5 U	5 U	5 U	5 U	10 U	10 U	10 U	5 U	5 U	5 U	5 U	2.5 U
Acetone	50 R	5 U	5 U	5 UL	10 U	10 U	10 U	20 U	5 U	10 R	10 R	2.5 R
Bromodichloromethane	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	5 U	0.25 U
Carbon disulfide	2.6 B	0.5 U	0.5 UJ	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	5 U	0.5 U
Carbon tetrachloride	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	5 U	0.25 U
Chlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	5 U	0.125 U
Chloroform	0.37 J	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	5 U	0.125 U
Chloromethane	0.5 U	0.5 U	0.5 UJ	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	5 U	0.5 U
cis-1,2-Dichloroethene	19	17	31 J	15	11	16	20	28	13	16.8	16.1	21
Dichlorodifluoromethane (Freon-12)	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	5 U	0.25 U
Methylene chloride	0.69 B	0.5 U	1.2 B	11 L	1 B	10 U	10 U	5 U	1 U	0.286 B	5 U	0.25 U
Tetrachloroethene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	0.22 J	5 U	5 U	0.25 U
Toluene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	5 U	0.25 U
trans-1,2-Dichloroethene	0.5 U	0.5 U	0.87	0.5 U	10 U	10 U	10 U	5 U	0.38 J	5 U	5 U	0.25 U
Trichloroethene	60 K	33	40 J	40 L	22	70	30	33	28	23.8	21.9	25.8
Trichlorofluoromethane (Freon-11)	0.61	0.5 U	1	0.42 J	10 U	10 U	10 U	5 U	0.44 J	5 U	0.517 J	0.5 U
Vinyl chloride	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	1 U	2 U	2 U	0.25 U
Total Metals (UG/L)												
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dissolved Metals (UG/L)												
Aluminum, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Notes:

Shading indicates detections

NA - Not analyzed

B - Analyte not detected above the level reported in blanks

J - Analyte present, value may or may not be accurate or precise

K - Analyte present, value may be biased high, actual value may be lower

L - Analyte present, value may be biased low, actual value may be higher

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Table 3-1
Groundwater Detected Analytical Results from Triquarterly Monitoring Well Network: 2003 to 2011
Interim Remedial Action Completion Report, Site 10, OU-5
Allegany Ballistics Laboratory
Rocket Center, West Virginia

Station ID	10EW40								10EW40			
Sample ID	AS10-10EW40-R07	AS10-10EW40-R08	AS10-10EW40-R09	AS10-10EW40-R10	AS10-10EW40-R12	AS10-10EW40-R13	AS10-10EW40P-R14	AS10-10EW40-R14	AS10-10EW40-R15	AS10-10EW40-R16	AS10-10EW40-R17	AS10-10EW40-R18
Sample Date	07/22/03	04/14/04	01/19/05	10/25/05	04/18/07	01/28/08	10/16/08	10/16/08	07/22/09	04/22/10	01/15/11	10/12/11
Chemical Name												
Volatile Organic Compounds (UG/L)												
1,1,1-Trichloroethane	1.8	1	1.8	1.1	10 U	1 J	5 U	5 U	5 U	0.78 J	0.691 J	0.501 J
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	5.4	2.2	9.7	2.6 J	3 J	2 J	6.4	6.5	2.5 J	5 UL	2.15 J	2.06
1,1-Dichloroethane	0.57	0.4 J	0.92	0.82	10 U	10 U	5 U	5 U	5 U	0.452 J	0.486 J	0.404 J
1,1-Dichloroethene	1.2	0.75	0.5 U	1.6	10 U	10 U	1.3 J	5 U	5 U	0.807 J	0.89 J	0.811 J
1,2,3-Trichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene (total)	NA	NA	NA	NA	21	20	NA	NA	NA	NA	NA	NA
2-Hexanone	12 L	5 U	5 U	5 U	10 U	10 U	5 U	5 U	25 U	5 U	2.5 U	2.5 U
4-Methyl-2-pentanone	3.3 J	5 U	5 U	5 U	10 U	10 U	5 U	5 U	25 U	5 U	2.5 U	2.5 U
Acetone	130 R	5 U	5 U	5 UL	10 U	10 U	20 U	20 U	25 U	10 R	2.5 R	5 U
Bromodichloromethane	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	5 U	5 U	0.25 U	0.5 U
Carbon disulfide	16 B	0.5 U	0.5 UJ	0.81	10 U	10 U	5 U	5 U	5 U	5 U	0.5 U	0.5 U
Carbon tetrachloride	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	5 U	5 U	0.25 U	0.5 U
Chlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	5 U	5 U	0.125 U	0.5 U
Chloroform	0.5 U	0.5 U	0.47 J	0.5 U	10 U	10 U	5 U	5 U	5 U	0.134 J	0.139 B	0.5 U
Chloromethane	0.5 U	0.5 U	0.5 UJ	0.5 U	10 U	10 U	5 U	5 U	5 U	5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	13	11	25	28 L	21	20	28	29	17	17.4	20.2	18.9
Dichlorodifluoromethane (Freon-12)	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	5 U	5 U	0.25 U	1 U
Methylene chloride	0.5 UJ	0.5 U	1.2 B	4.6 L	10 U	10 U	5 U	5 U	5 U	5 UL	0.25 U	1 U
Tetrachloroethene	0.5 U	0.5 U	0.52	0.6 J	10 U	10 U	5 U	5 U	0.75 J	0.919 J	0.994 J	0.728 J
Toluene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	5 U	5 U	0.25 U	0.5 U
trans-1,2-Dichloroethene	0.45 J	0.5 U	0.91	0.5 U	10 U	10 U	5 U	5 U	5 U	5 U	0.25 U	0.5 U
Trichloroethene	130 K	59	76 J	100 L	82	81	87	89	58	59.7 L	65.2	57.4
Trichlorofluoromethane (Freon-11)	0.84	0.5 U	1.3	0.5 U	10 U	1 J	5 U	5 U	5 U	0.82 J	0.671 J	0.505 J
Vinyl chloride	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	5 U	2 U	0.25 U	0.5 U
Total Metals (UG/L)												
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dissolved Metals (UG/L)												
Aluminum, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Table 3-1
Groundwater Detected Analytical Results from Triquarterly Monitoring Well Network: 2003 to 2011
Interim Remedial Action Completion Report, Site 10, OU-5
Allegany Ballistics Laboratory
Rocket Center, West Virginia

Station ID	10EW41								10EW41					
Sample ID	AS10-10EW41-R07	AS10-10EW41-R08	AS10-10EW41P-R10	AS10-10EW41-R10	AS10-10EW41-R11	AS10-10EW41-R12	AS10-10EW41P-R13	AS10-10EW41-R13	AS10-10EW41-R14	AS10-10EW41P-R15	AS10-10EW41-R15	AS10-10EW41-R16	AS10-10EW41-R17	AS10-10EW41-R18
Sample Date	07/22/03	04/14/04	10/25/05	10/25/05	08/11/06	04/18/07	01/31/08	01/31/08	10/16/08	07/22/09	07/22/09	04/22/10	01/15/11	10/12/11
Chemical Name														
Volatile Organic Compounds (UG/L)														
1,1,1-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 UJ	10 U	10 U	5 U	1 U	1 U	5 U	0.25 U	0.5 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	160	2.4	3.7 J	3.4 J	3 J	2 J	2 J	3 J	6.3	1.7	1.5	2.24 J	2 U	1.87 J
1,1-Dichloroethane	0.5 U	0.5 U	0.5 U	0.5 UJ	10 U	10 UJ	10 U	10 U	5 U	1 U	1 U	5 U	0.125 U	0.5 U
1,1-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 UJ	10 U	10 UJ	10 U	10 U	5 U	1 U	1 U	5 U	0.5 U	0.5 U
1,2,3-Trichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA	10 UJ	10 U	10 U	NA	NA	NA	NA	NA	NA
2-Hexanone	130 R	5 U	5 U	5 U	10 U	10 UJ	10 U	10 U	5 U	5 U	5 U	5 U	2.5 U	2.5 U
4-Methyl-2-pentanone	5 U	5 U	5 U	5 U	10 U	10 UJ	10 U	10 U	5 U	5 U	5 U	5 U	2.5 U	2.5 U
Acetone	130 R	5 U	5 UL	5 UL	10 UJ	10 UJ	10 U	10 U	20 U	5 U	5 U	10 R	2.5 R	5 U
Bromodichloromethane	0.5 U	0.5 U	0.5 U	0.5 UL	10 U	10 UJ	10 U	10 U	5 U	1 U	1 U	5 U	0.25 U	0.5 U
Carbon disulfide	8.3 B	0.5 U	2.4	0.5 UJ	10 U	10 UJ	10 U	10 U	5 U	1 U	1 U	5 U	0.5 U	0.5 U
Carbon tetrachloride	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 UJ	10 U	10 U	5 U	1 U	1 U	5 U	0.25 U	0.5 U
Chlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 UJ	10 U	10 U	5 U	1 U	1 U	5 U	0.125 U	0.5 U
Chloroform	0.46 J	0.5 U	0.5 U	0.5 UJ	10 U	10 UJ	10 U	10 U	5 U	1 U	0.17 J	0.126 J	0.138 B	0.5 U
Chloromethane	0.5 U	0.37 J	0.5 U	0.5 UJ	10 U	10 UJ	10 U	10 U	5 U	1 U	1 U	5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	1.6	0.93	1.5	1.4 J	10 U	10 UJ	10 U	10 U	1.3 J	1 U	1 U	1.24 J	1.48 J	1.5
Dichlorodifluoromethane (Freon-12)	0.5 U	0.5 U	0.47 J	0.56 J	10 U	10 UJ	10 U	10 U	5 U	1 U	1 U	5 U	0.25 U	1 U
Methylene chloride	1.4 B	0.5 U	0.5 U	0.5 UJ	10 U	10 UJ	10 U	10 U	5 U	1 U	1 U	0.417 B	0.25 U	1 U
Tetrachloroethene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 UJ	10 U	10 U	5 U	1 U	1 U	5 U	0.25 U	0.5 U
Toluene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 UJ	10 U	10 U	5 U	1 U	1 U	5 U	0.25 U	0.5 U
trans-1,2-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 UJ	10 U	10 UJ	10 U	10 U	5 U	1 U	1 U	5 U	0.25 U	0.5 U
Trichloroethene	10	7.5	9 J	9.2	9 J	8 J	9 J	8 J	11	7.7	7.6	9.43	9.42	8.3
Trichlorofluoromethane (Freon-11)	0.31 J	0.5 U	0.5 U	0.5 UJ	10 U	10 UJ	10 U	10 U	5 U	1 U	1 U	5 U	0.5 U	1 U
Vinyl chloride	0.5 U	0.5 U	0.5 U	0.5 UJ	10 U	10 UJ	10 U	10 U	5 U	1 U	1 U	2 U	0.25 U	0.5 U
Total Metals (UG/L)														
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dissolved Metals (UG/L)														
Aluminum, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Notes:

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Interim Remedial Action Completion Report, Site 10, OU-5
Allegany Ballistics Laboratory
Rocket Center, West Virginia

Station ID	10EW42								10EW42			
Sample ID	AS10-10EW42-R07	AS10-10EW42-R08	AS10-10EW42-R09	AS10-10EW42-R10	AS10-10EW42-R11	AS10-10EW42-R12	AS10-10EW42-R13	AS10-10EW42-R14	AS10-10EW42-R15	AS10-10EW42-R16	AS10-10EW42-R17	AS10-10EW42-R18
Sample Date	07/22/03	04/14/04	01/19/05	10/25/05	08/10/06	04/18/07	01/28/08	10/16/08	07/22/09	05/07/10	01/15/11	10/12/11
Chemical Name												
Volatile Organic Compounds (UG/L)												
1,1,1-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 UJ	10 U	5 U	20 U	5 U	0.25 U	0.5 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	370	430	2,400 J	560 L	490	530 J	370	380	240	185	318	194
1,1-Dichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 UJ	10 U	5 U	20 U	5 U	0.125 U	0.5 U
1,1-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 UJ	10 U	5 U	20 U	5 U	0.5 U	0.5 U
1,2,3-Trichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA	4 J	3 J	NA	NA	NA	NA	NA
2-Hexanone	250 R	5 U	5 U	5 U	10 U	10 UJ	10 U	5 U	100 U	5 U	2.5 U	2.5 U
4-Methyl-2-pentanone	5 U	5 U	5 U	5 U	10 U	10 UJ	10 U	5 U	100 U	5 U	2.5 U	2.5 U
Acetone	250 R	5 U	5 U	5 UL	10 UJ	10 UJ	10 U	20 U	100 U	8.72 J	2.5 R	5 U
Bromodichloromethane	65	0.5 U	0.5 U	0.5 U	10 U	10 UJ	10 U	5 U	20 U	5 U	0.25 U	0.5 U
Carbon disulfide	1.8 B	0.5 U	0.5 UJ	0.5 U	10 U	10 UJ	10 U	5 U	20 U	5 U	0.5 U	0.5 U
Carbon tetrachloride	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 UJ	10 U	5 U	20 U	5 U	0.25 U	0.5 U
Chlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 UJ	10 U	5 U	20 U	5 U	0.125 U	0.5 U
Chloroform	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 UJ	10 U	5 U	20 U	5 U	0.125 U	0.5 U
Chloromethane	0.5 U	0.5 U	0.5 UJ	0.5 U	10 U	10 UJ	10 U	5 U	20 U	5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	3.3	2.8	5.6	3.5 J	2 J	4 J	3 J	1.7 J	20 U	3.55 J	3.91 J	3.65
Dichlorodifluoromethane (Freon-12)	0.5 U	15	0.5 U	54 L	10 U	10 UJ	10 U	26	20 U	14.2	0.25 U	32.4
Methylene chloride	1.4 B	0.5 U	0.5 UJ	18 L	1 B	10 UJ	10 U	5 U	20 U	5 U	0.25 U	1 U
Tetrachloroethene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 UJ	10 U	5 U	20 U	5 U	0.25 U	0.5 U
Toluene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 UJ	10 U	5 U	20 U	5 U	0.25 U	0.5 U
trans-1,2-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 UJ	10 U	10 UJ	10 U	5 U	20 U	5 U	0.25 U	0.5 U
Trichloroethene	15 K	12	20	10 J	9 J	14 J	13	27	10 J	10.3	14.1	11.6
Trichlorofluoromethane (Freon-11)	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 UJ	10 U	5 U	20 U	5 U	0.509 J	1 U
Vinyl chloride	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 UJ	10 U	5 U	20 U	2 U	0.296 J	0.345 J
Total Metals (UG/L)												
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dissolved Metals (UG/L)												
Aluminum, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Notes:

Shading indicates detections

NA - Not analyzed

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R - Unreliable Result

U - The material was analyzed for, but not detected

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UL - Analyte not detected, quantitation limit is probably higher

UG/L - Micrograms per liter

Table 3-1
Groundwater Detected Analytical Results from Triquarterly Monitoring Well Network: 2003 to 2011
Interim Remedial Action Completion Report, Site 10, OU-5
Allegany Ballistics Laboratory
Rocket Center, West Virginia

Station ID	10GW06								10GW06				
Sample ID	AS10-10GW06-R07	AS10-10GW06-R08	AS10-10GW06-R09	AS10-10GW06-R10	AS10-10GW06-R11	AS10-10GW06-R12	AS10-10GW06-R13	AS10-10GW06-R14	AS10-10GW06-R15	AS10-10GW06-R16	AS10-10GW06P-R17	AS10-10GW06-R17	AS10-10GW06-R18
Sample Date	07/24/03	04/14/04	01/17/05	10/25/05	08/10/06	05/07/07	01/28/08	10/21/08	07/22/09	04/27/10	01/25/11	01/25/11	10/17/11
Chemical Name													
Volatile Organic Compounds (UG/L)													
1,1,1-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	0.25 U	0.25 U	0.5 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	6.4	3.9	9.1	3.5	2 J	1 J	1 J	5 U	0.42 J	5 U	2 U	2 U	1.31 J
1,1-Dichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	0.125 U	0.125 U	0.5 U
1,1-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	0.5 U	0.5 U	0.5 U
1,2,3-Trichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA	10 U	10 U	NA	NA	NA	NA	NA	NA
2-Hexanone	5 R	5 U	5 U	5 U	10 U	10 U	10 U	5 U	5 U	5 U	2.5 U	2.5 U	2.5 U
4-Methyl-2-pentanone	3.4 J	5 U	5 U	5 U	10 U	10 U	10 U	5 U	0.67 J	5 U	2.5 R	2.5 R	2.5 U
Acetone	5 B	5 U	5 U	5 UL	10 UJ	10 U	4 B	20 U	16 B	10.8 B	16.6 L	16.9 L	3.6 B
Bromodichloromethane	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	0.25 U	0.25 U	0.5 U
Carbon disulfide	3.1 B	0.5 U	0.5 UJ	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	0.5 U	0.5 U	0.5 U
Carbon tetrachloride	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	0.25 U	0.25 U	0.5 U
Chlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	0.125 U	0.125 U	0.5 U
Chloroform	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	0.125 U	0.125 U	0.5 U
Chloromethane	0.5 U	0.41 B	0.5 UJ	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	0.5 U	0.5 U	0.43 B	0.85 L	10 U	10 U	10 U	5 U	1 U	5 U	0.25 U	0.25 U	0.5 U
Dichlorodifluoromethane (Freon-12)	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	0.25 U	0.25 U	1 U
Methylene chloride	1.1 B	0.5 U	0.66 B	0.5 U	1 B	10 U	10 U	5 U	1 U	5 U	0.25 U	0.25 U	1 U
Tetrachloroethene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	0.25 U	0.25 U	0.5 U
Toluene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	0.25 U	0.25 U	0.5 U
trans-1,2-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 UL	10 U	10 U	10 U	5 U	1 U	5 U	0.25 U	0.25 U	0.5 U
Trichloroethene	2.5	0.92	2	1.6	10 U	10 U	10 U	5 U	0.33 J	0.265 J	0.461 J	0.292 J	0.5 U
Trichlorofluoromethane (Freon-11)	2.2	0.64	2.2	0.86	10 U	2 J	10 U	5 U	1 U	0.648 J	0.5 U	0.5 U	1 U
Vinyl chloride	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	1 U	2 U	0.25 U	0.25 U	0.5 U
Total Metals (UG/L)													
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dissolved Metals (UG/L)													
Aluminum, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Notes:

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UG/L - Micrograms per liter

Table 3-1
Groundwater Detected Analytical Results from Triquarterly Monitoring Well Network: 2003 to 2011
Interim Remedial Action Completion Report, Site 10, OU-5
Allegany Ballistics Laboratory
Rocket Center, West Virginia

Station ID	10GW12					
Sample ID	AS10-10GW12-R07	AS10-10GW12-R09	AS10-10GW12-R10	AS10-10GW12-R11	AS10-10GW12-R12	AS10-10GW12-R13
Sample Date	07/24/03	01/17/05	10/25/05	08/10/06	05/07/07	01/28/08
Chemical Name						
Volatile Organic Compounds (UG/L)						
1,1,1-Trichloroethane	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U
1,1-Dichloroethane	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U
1,1-Dichloroethene	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U
1,2,3-Trichlorobenzene	0.5 U	0.5 U	0.5 U	NA	NA	NA
1,2-Dichloroethene (total)	NA	NA	NA	NA	10 U	10 U
2-Hexanone	5 R	5 U	5 U	10 U	10 U	10 U
4-Methyl-2-pentanone	5 U	5 U	5 U	10 U	10 U	10 U
Acetone	5.8 B	5 U	5 UL	10 U	10 U	5 B
Bromodichloromethane	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U
Carbon disulfide	13 B	5.6 B	2.8	10 U	10 U	10 U
Carbon tetrachloride	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U
Chlorobenzene	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U
Chloroform	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U
Chloromethane	0.5 U	0.5 UJ	0.5 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U
Dichlorodifluoromethane (Freon-12)	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U
Methylene chloride	0.94 B	0.58 B	0.5 U	2 B	10 U	10 U
Tetrachloroethene	0.41 J	0.5 U	0.5 U	10 U	10 U	10 U
Toluene	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U
trans-1,2-Dichloroethene	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U
Trichloroethene	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U
Trichlorofluoromethane (Freon-11)	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U
Vinyl chloride	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U
Total Metals (UG/L)						
Barium	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA
Dissolved Metals (UG/L)						
Aluminum, Dissolved	NA	NA	NA	NA	NA	NA
Barium, Dissolved	NA	NA	NA	NA	NA	NA
Calcium, Dissolved	NA	NA	NA	NA	NA	NA
Chromium, Dissolved	NA	NA	NA	NA	NA	NA
Cobalt, Dissolved	NA	NA	NA	NA	NA	NA
Copper, Dissolved	NA	NA	NA	NA	NA	NA
Iron, Dissolved	NA	NA	NA	NA	NA	NA
Magnesium, Dissolved	NA	NA	NA	NA	NA	NA
Manganese, Dissolved	NA	NA	NA	NA	NA	NA
Nickel, Dissolved	NA	NA	NA	NA	NA	NA
Potassium, Dissolved	NA	NA	NA	NA	NA	NA
Sodium, Dissolved	NA	NA	NA	NA	NA	NA
Vanadium, Dissolved	NA	NA	NA	NA	NA	NA

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Notes:

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Table 3-1
Groundwater Detected Analytical Results from Triquarterly Monitoring Well Network: 2003 to 2011
Interim Remedial Action Completion Report, Site 10, OU-5
Allegany Ballistics Laboratory
Rocket Center, West Virginia

Station ID	10GW12								10GW15				
Sample ID	AS10-10GW12-R14	AS10-10GW12P-R15	AS10-10GW12-R15	AS10-10GW12C-R16	AS10-10GW12-R16	AS10-10GW12-R17	AS10-10GW12-R18	AS10-10GW12C-R18	AS10-10GW15P-R07	AS10-10GW15-R07	AS10-10GW15P-R08	AS10-10GW15-R08	AS10-10GW15P-R09
Sample Date	10/21/08	07/22/09	07/22/09	04/27/10	04/27/10	01/25/11	10/17/11	10/18/11	07/24/03	07/24/03	04/14/04	04/14/04	01/17/05
Chemical Name													
Volatile Organic Compounds (UG/L)													
1,1,1-Trichloroethane	5 U	1 U	1 U	5 U	5 U	0.25 U	0.5 U	0.5 U	0.52	0.5 J	0.38 J	0.38 J	0.72
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	5 U	1 U	1 U	5 U	5 U	2 U	1 U	1 U	120	120	100	100	230
1,1-Dichloroethane	5 U	1 U	1 U	5 U	5 U	0.125 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethene	5 U	1 U	1 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,3-Trichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	5 U	5 U	5 U	5 U	5 U	2.5 U	2.5 U	2.5 U	50 R	50 R	5 U	5 U	5 U
4-Methyl-2-pentanone	5 U	0.84 J	0.76 J	5 U	5 U	2.5 R	2.5 U	2.5 U	5 U	5 U	5 U	5 U	5 U
Acetone	20 U	21 B	20 B	10 R	10.5 B	11.7 L	3.98 B	5 U	35 R	50 R	5 U	5 U	5 U
Bromodichloromethane	5 U	1 U	1 U	5 U	5 U	0.25 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Carbon disulfide	5 U	1 U	1 U	5 U	5 U	0.5 U	0.5 U	0.5 U	7.4 B	10 B	0.5 U	0.5 U	3.5 B
Carbon tetrachloride	5 U	1 U	1 U	5 U	5 U	0.25 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.33 J
Chlorobenzene	5 U	1 U	1 U	5 U	5 U	0.125 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chloroform	5 U	1 U	1 U	5 U	5 U	0.125 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chloromethane	5 U	1 U	1 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.35 B	0.5 U	0.5 UJ
cis-1,2-Dichloroethene	5 U	1 U	1 U	5 U	5 U	0.25 U	0.5 U	0.5 U	0.5 U	0.5 U	0.51	0.5 J	1.3 B
Dichlorodifluoromethane (Freon-12)	5 U	1 U	1 U	5 U	5 U	0.25 U	1 U	1 U	0.5 U	0.5 U	0.41 J	0.42 J	0.5 U
Methylene chloride	5 U	1 U	0.36 J	5 U	5 U	0.336 J	1 U	1 U	0.98 B	1 B	1.2 B	1 B	0.63 B
Tetrachloroethene	5 U	1 U	1 U	5 U	5 U	0.25 U	0.5 U	0.5 U	1	1.3	0.78	0.89	1.3
Toluene	5 U	1 U	1 U	5 U	5 U	0.25 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.58
trans-1,2-Dichloroethene	5 U	1 U	1 U	5 U	5 U	0.25 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Trichloroethene	5 U	1 U	1 U	5 U	5 U	0.25 U	0.5 U	0.5 U	9.1	8.9	7.3	7.5	11 B
Trichlorofluoromethane (Freon-11)	5 U	1 U	1 U	5 U	5 U	0.5 U	1 U	1 U	0.5 U	0.5 U	0.4 J	0.39 J	1
Vinyl chloride	5 U	1 U	1 U	2 U	2 U	0.25 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Total Metals (UG/L)													
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dissolved Metals (UG/L)													
Aluminum, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Notes:

Shading indicates detections

NA - Not analyzed

B - Analyte not detected above the level reported in blanks

J - Analyte present, value may or may not be accurate or precise

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R - Unreliable Result

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate

UL - Analyte not detected, quantitation limit is probably higher

UG/L - Micrograms per liter

Table 3-1
Groundwater Detected Analytical Results from Triquarterly Monitoring Well Network: 2003 to 2011
Interim Remedial Action Completion Report, Site 10, OU-5
Allegany Ballistics Laboratory
Rocket Center, West Virginia

Station ID	10GW15													
Sample ID	AS10-10GW15-R09	AS10-10GW15P-R10	AS10-10GW15-R10	AS10-10GW15-R11	AS10-10GW15P-R12	AS10-10GW15-R12	AS10-10GW15-R13	AS10-10GW15-R14	AS10-10GW15-R15	AS10-10GW15C-R16	AS10-10GW15-R16	AS10-10GW15-R17	AS10-10GW15P-R18	AS10-10GW15-R18
Sample Date	01/17/05	10/25/05	10/25/05	08/10/06	05/07/07	05/07/07	01/28/08	10/21/08	07/22/09	04/27/10	04/27/10	01/25/11	10/17/11	10/17/11
Chemical Name														
Volatile Organic Compounds (UG/L)														
1,1,1-Trichloroethane	0.73	0.5 J	0.53 J	10 U	10 U	10 U	10 U	5 U	2 U	0.298 J	0.3 J	0.303 J	0.258 J	0.5 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	290	82 L	82 L	61	100	110	82	54 J	74	144	132	84.6	91.7	91.6
1,1-Dichloroethane	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	5 U	2 U	5 U	5 U	0.125 U	0.5 U	0.5 U
1,1-Dichloroethene	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	5 U	2 U	5 U	5 U	0.5 U	0.5 U	0.5 U
1,2,3-Trichlorobenzene	0.5 U	0.5 U	0.5 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene (total)	NA	NA	NA	NA	10 U	10 U	10 U	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	5 U	5 U	5 U	10 U	10 U	10 U	10 U	5 U	10 U	5 U	5 U	2.5 U	2.5 U	2.5 U
4-Methyl-2-pentanone	5 U	5 U	5 U	10 U	10 U	10 U	10 U	5 U	10 U	5 U	5 U	2.5 U	2.5 U	2.5 U
Acetone	5 U	5 UL	5 UL	10 UJ	10 U	4 B	3 B	20 U	21 B	10.2 B	18.1 B	29.6 L	3.2 B	4.26 B
Bromodichloromethane	0.5 U	0.5 UL	0.5 U	10 U	10 U	10 U	10 U	5 U	2 U	5 U	5 U	0.25 U	0.5 U	0.5 U
Carbon disulfide	7.8 B	0.5 UJ	0.5 UJ	10 U	10 U	10 U	10 U	5 U	2 U	5 U	5 U	0.5 U	0.5 U	0.5 U
Carbon tetrachloride	0.33 J	0.5 U	0.5 U	10 U	10 U	10 U	10 U	5 U	2 U	0.292 J	0.313 J	0.25 U	0.5 U	0.5 U
Chlorobenzene	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	5 U	2 U	5 U	5 U	0.125 U	0.5 U	0.5 U
Chloroform	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	5 U	2 U	5 U	5 U	0.125 U	0.5 U	0.5 U
Chloromethane	0.5 UJ	0.5 U	0.5 U	10 U	10 U	10 U	10 U	5 U	2 U	5 U	5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	0.42 J	0.47 L	0.5 L	10 U	10 U	10 U	10 U	5 U	2 U	0.304 J	0.301 J	0.354 J	0.374 J	0.362 J
Dichlorodifluoromethane (Freon-12)	0.5 U	0.58	0.96	10 U	10 U	10 U	10 U	5 U	2 U	5 U	5 U	0.366 J	1 U	1 U
Methylene chloride	0.67 B	0.5 U	0.5 U	10 U	10 U	10 U	10 U	5 U	2 U	5 U	0.254 B	0.25 U	1 U	1 U
Tetrachloroethene	1.5	1.1	1.1	10 U	10 U	10 U	10 U	5 U	0.43 J	0.607 J	0.492 J	0.626 J	0.281 J	0.253 J
Toluene	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	5 U	2 U	5 U	5 U	0.25 U	0.5 U	0.5 U
trans-1,2-Dichloroethene	0.5 U	0.5 UL	0.5 UL	10 U	10 U	10 U	10 U	5 U	2 U	5 U	5 U	0.25 U	0.5 U	0.5 U
Trichloroethene	13	8.8	8.7	6 J	6 J	6 J	6 J	5.3	5.4	6.09	6.33	7.53	6.11	6.12
Trichlorofluoromethane (Freon-11)	1.1	0.5 U	0.5 U	10 U	10 U	10 U	10 U	5 U	2 U	0.91 J	0.911 J	0.5 U	1 U	1 U
Vinyl chloride	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	5 U	2 U	2 U	2 U	0.25 U	0.5 U	0.5 U
Total Metals (UG/L)														
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dissolved Metals (UG/L)														
Aluminum, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Groundwater Detected Analytical Results from Triquarterly Monitoring Well Network: 2003 to 2011
Interim Remedial Action Completion Report, Site 10, OU-5
Allegany Ballistics Laboratory
Rocket Center, West Virginia

Station ID	10GW16													
Sample ID	AS10-10GW16-R07	AS10-10GW16-R08	AS10-10GW16-R09	AS10-10GW16-R10	AS10-10GW16-R11	AS10-10GW16-R11B	AS10-10GW16-R12	AS10-10GW16-R13	AS10-10GW16B-R13	AS10-10GW16-R14	AS10-10GW16-R15	AS10-10GW16-R16	AS10-10GW16-R17	AS10-10GW16-R18
Sample Date	07/25/03	04/14/04	01/17/05	10/25/05	08/10/06	08/10/06	05/07/07	01/28/08	02/01/08	10/21/08	07/22/09	04/27/10	01/25/11	10/17/11
Chemical Name														
Volatile Organic Compounds (UG/L)														
1,1,1-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U	5 U	1 U	5 U	0.25 U	0.5 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	0.5 U	0.5 U	0.5 U	0.46 J	10 U	10 U	10 U	10 U	10 U	5 U	1 U	5 UL	2 U	1 U
1,1-Dichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U	5 U	1 U	5 U	0.125 U	0.5 U
1,1-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U	5 U	1 U	5 U	0.5 U	0.5 U
1,2,3-Trichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA	NA	10 U	10 U	10 U	NA	NA	NA	NA	NA
2-Hexanone	5 R	5 U	5 U	5 U	10 U	10 U	10 U	10 U	10 U	5 U	5 U	5 U	2.5 U	2.5 U
4-Methyl-2-pentanone	5 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	10 U	5 U	0.78 J	5 U	2.5 R	2.5 U
Acetone	5 B	3.8 J	5 U	5 UL	10 UJ	10 UJ	10 U	10 U	10 U	20 U	21 B	9.51 B	14.5 L	5.78 B
Bromodichloromethane	0.5 UJ	0.5 U	0.5 U	0.5 UL	10 U	10 U	10 U	10 U	10 U	5 U	1 U	5 U	0.25 U	0.5 U
Carbon disulfide	5.4 B	0.5 U	7.4 B	0.5 U	10 U	10 U	10 U	10 U	10 U	5 U	1 U	5 U	0.5 U	0.5 U
Carbon tetrachloride	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U	5 U	1 U	5 U	0.25 U	0.5 U
Chlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U	5 U	1 U	5 U	0.125 U	0.5 U
Chloroform	0.5 U	0.86	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U	5 U	1 U	5 U	0.125 U	0.5 U
Chloromethane	0.5 U	0.41 B	0.5 UJ	0.5 U	10 U	10 U	10 U	10 U	10 U	5 U	1 U	5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U	5 U	1 U	5 U	0.25 U	0.5 U
Dichlorodifluoromethane (Freon-12)	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U	5 U	1 U	5 U	0.25 U	1 U
Methylene chloride	0.84 B	0.5 U	0.48 B	0.5 U	1 B	1 B	10 U	10 U	10 U	5 U	1 U	5 U	0.25 U	1 U
Tetrachloroethene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U	5 U	1 U	5 U	0.25 U	0.5 U
Toluene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U	5 U	1 U	5 U	0.25 U	0.5 U
trans-1,2-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U	5 U	1 U	5 U	0.25 U	0.5 U
Trichloroethene	0.5 U	0.89	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U	5 U	1 U	5 U	0.25 U	0.5 U
Trichlorofluoromethane (Freon-11)	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U	5 U	1 U	5 U	0.5 U	1 U
Vinyl chloride	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U	5 U	1 U	2 U	0.25 U	0.5 U
Total Metals (UG/L)														
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dissolved Metals (UG/L)														
Aluminum, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Table 3-1
Groundwater Detected Analytical Results from Triquarterly Monitoring Well Network: 2003 to 2011
Interim Remedial Action Completion Report, Site 10, OU-5
Allegany Ballistics Laboratory
Rocket Center, West Virginia

Station ID	10GW20															
Sample ID	AS10-10GW20P-R07	AS10-10GW20-R07	AS10-10GW20-R07B	AS10-10GW20P-R08	AS10-10GW20-R08	AS10-10GW20P-R09	AS10-10GW20-R09	AS10-10GW20-R09B	AS10-10GW20P-R10	AS10-10GW20-R10	AS10-10GW20P-R11	AS10-10GW20-R11	AS10-10GW20-R12	AS10-10GW20P-R13	AS10-10GW20-R13	AS10-10GW20-R14
Sample Date	07/24/03	07/24/03	07/29/03	04/14/04	04/14/04	01/17/05	01/17/05	01/31/05	10/25/05	10/25/05	08/10/06	08/10/06	05/07/07	01/28/08	01/28/08	10/21/08
Chemical Name																
Volatile Organic Compounds (UG/L)																
1,1,1-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	50 U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U	5 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	1,300	1,200	1,500	930	1,200	4,800	3,600 R	4,900	2,600 J	2,700 J	1,200	1,200	1,000	770	750	440 J
1,1-Dichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	50 U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U	5 U
1,1-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	50 U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U	5 U
1,2,3-Trichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	50 U	0.5 U	0.5 U	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2 J	2 J	2 J	NA
2-Hexanone	500 R	500 R	1,300 R	5 U	5 U	5 U	5 U	500 U	5 U	5 U	10 U	10 U	10 U	10 U	10 U	5 U
4-Methyl-2-pentanone	5 U	5 U	5 U	5 U	5 U	5 U	5 U	500 U	5 U	5 U	10 U	10 U	10 U	10 U	10 U	5 U
Acetone	400 R	500 R	1,300 R	5 U	5 U	5 U	5 U	500 U	5 UL	5 UL	10 UJ	10 UJ	10 U	7 B	4 B	20 U
Bromodichloromethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	50 U	0.5 UL	0.5 UL	10 U	10 U	10 U	10 U	10 U	5 U
Carbon disulfide	5 B	4.3 B	30 B	0.5 U	0.5 U	30,000 J	19,000 J	4,300 J	0.5 UJ	0.5 UJ	10 U	10 U	10 U	10 U	10 U	5 U
Carbon tetrachloride	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	50 U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U	5 U
Chlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	50 U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U	5 U
Chloroform	0.54	0.35 J	0.35 J	0.5 U	0.5 U	0.5 U	0.5 U	50 U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U	5 U
Chloromethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 UJ	50 UJ	0.5 U	62 J	10 U	10 U	10 U	10 U	10 U	5 U
cis-1,2-Dichloroethene	3	3	3.2	2.6	2.6	3.3	2.9 B	50 U	3 L	3.1 L	10 U	1 J	2 J	2 J	2 J	2.3 J
Dichlorodifluoromethane (Freon-12)	0.5 U	0.5 U	0.5 U	36 J	25 R	0.5 U	0.5 U	50 U	160 L	200 L	10 U	10 U	10 U	10 U	10 U	30
Methylene chloride	1.1 B	1.1 B	0.87 B	1.7 B	1.4 B	0.5 U	1.4 B	85 B	0.5 U	90 L	10 U	1 B	10 U	10 U	10 U	5 U
Tetrachloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	50 U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U	5 U
Toluene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	50 U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U	5 U
trans-1,2-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	50 U	0.5 UL	0.5 UL	10 U	10 U	10 U	10 U	10 U	5 U
Trichloroethene	34 J	76	36 J	49	23	39 J	38 B	67	47 L	59 L	21	22	25	30	29 J	23
Trichlorofluoromethane (Freon-11)	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	50 U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U	5 U
Vinyl chloride	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	50 U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U	5 U
Total Metals (UG/L)																
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dissolved Metals (UG/L)																
Aluminum, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Notes:

Shading indicates detections

NA - Not analyzed

B - Analyte not detected above the level reported in blanks

J - Analyte present, value may or may not be accurate or precise

K - Analyte present, value may be biased high, actual value may be lower

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R - Unreliable Result

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate

UL - Analyte not detected, quantitation limit is probably higher

UG/L - Micrograms per liter

Table 3-1
Groundwater Detected Analytical Results from Triquarterly Monitoring Well Network: 2003 to 2011
Interim Remedial Action Completion Report, Site 10, OU-5
Allegany Ballistics Laboratory
Rocket Center, West Virginia

Station ID	10GW20				10GW23								
Sample ID	AS10-10GW20-R15	AS10-10GW20-R16	AS10-10GW20-R17	AS10-10GW20-R18	AS10-10GW23-R11	AS10-10GW23-R12	AS10-10GW23-R13	AS10-10GW23-R14	AS10-10GW23-R15	AS10-10GW23-R16	AS10-10GW23-R17	AS10-10GW23-R18	AS10-10GW23C-R18
Sample Date	07/22/09	04/27/10	01/25/11	10/17/11	08/10/06	05/07/07	01/28/08	10/21/08	07/22/09	04/27/10	01/25/11	10/17/11	10/18/11
Chemical Name													
Volatile Organic Compounds (UG/L)													
1,1,1-Trichloroethane	20 U	5 U	0.25 U	1 U	10 U	10 U	10 U	5 U	10 U	0.313 J	0.478 J	0.32 J	0.327 J
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	420	248 J	431	181	220	220	200	170 J	150	102	173	65	59.3
1,1-Dichloroethane	20 U	5 U	0.125 U	1 U	10 U	10 U	10 U	5 U	10 U	5 U	0.227 J	0.5 U	0.5 U
1,1-Dichloroethene	20 U	5 U	0.5 U	1 U	10 U	10 U	10 U	5 U	10 U	5 U	0.5 U	0.5 U	0.5 U
1,2,3-Trichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA	2 J	3 J	NA	NA	NA	NA	NA	NA
2-Hexanone	100 U	5 U	2.5 U	5 U	10 U	10 U	10 U	5 U	50 U	5 U	2.5 U	2.5 U	2.5 U
4-Methyl-2-pentanone	100 U	5 U	2.5 R	5 U	10 U	10 U	10 U	5 U	50 U	5 U	2.5 R	2.5 U	2.5 U
Acetone	100 U	29.4 B	13.3 L	10 U	10 UJ	10 U	4 B	20 U	29 B	15.7 B	15.3 L	5 U	5 U
Bromodichloromethane	20 U	5 U	0.25 U	1 U	10 U	10 U	10 U	5 U	10 U	5 U	0.25 U	0.5 U	0.5 U
Carbon disulfide	20 U	5 U	0.5 U	1 U	10 U	10 U	10 U	5 U	10 U	5 U	0.5 U	0.5 U	0.5 U
Carbon tetrachloride	20 U	5 U	0.25 U	1 U	10 U	10 U	10 U	5 U	10 U	5 U	0.25 U	0.5 U	0.5 U
Chlorobenzene	20 U	5 U	0.125 U	1 U	10 U	10 U	10 U	5 U	10 U	5 U	0.125 U	0.5 U	0.5 U
Chloroform	20 U	5 U	0.125 U	1 U	10 U	10 U	10 U	5 U	10 U	5 U	0.125 U	0.5 U	0.5 U
Chloromethane	20 U	5 U	0.5 U	1 U	10 U	10 U	10 U	5 U	10 U	5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	20 U	1.98 J	2.25 J	1.67 J	2 J	2 J	3 J	4.7 J	10 U	2.68 J	5.12	1.24	1.39
Dichlorodifluoromethane (Freon-12)	20 U	5 U	0.25 U	15.6	10 U	10 U	10 U	5 U	10 U	5 U	0.25 U	1 U	1 U
Methylene chloride	20 U	5 U	0.288 J	2 U	1 B	10 U	10 U	5 U	10 U	0.374 B	0.25 U	1 U	1 U
Tetrachloroethene	20 U	5 U	0.25 U	1 U	10 U	10 U	10 U	5 U	10 U	0.609 J	0.775 J	0.495 J	0.649 J
Toluene	20 U	5 U	0.25 U	1 U	10 U	10 U	10 U	5 U	10 U	5 U	0.25 U	0.5 U	0.5 U
trans-1,2-Dichloroethene	20 U	5 U	0.25 U	1 U	10 U	10 U	10 U	5 U	10 U	5 U	0.25 U	0.5 U	0.5 U
Trichloroethene	22	22.5	26.5	16.5	29	28	34	27	25	22.9	29.9	17.3	18.4
Trichlorofluoromethane (Freon-11)	20 U	0.534 J	0.5 U	2 U	10 U	10 U	10 U	5 U	10 U	5 U	0.5 U	1 U	1 U
Vinyl chloride	20 U	2 U	0.25 U	1 U	10 U	10 U	10 U	5 U	10 U	2 U	0.533 J	0.5 U	0.5 U
Total Metals (UG/L)													
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dissolved Metals (UG/L)													
Aluminum, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Notes:

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UG/L - Micrograms per liter

Table 3-1
Groundwater Detected Analytical Results from Triquarterly Monitoring Well Network: 2003 to 2011
Interim Remedial Action Completion Report, Site 10, OU-5
Allegany Ballistics Laboratory
Rocket Center, West Virginia

Station ID	10GW29													
Sample ID	AS10-10GW29-R07	AS10-10GW29-R08	AS10-10GW29-R09	AS10-10GW29-R10	AS10-10GW29P-R11	AS10-10GW29-R11	AS10-10GW29-R11B	AS10-10GW29-R12	AS10-10GW29-R13	AS10-10GW29-R14	AS10-10GW29-R15	AS10-10GW29-R16	AS10-10GW29-R17	AS10-10GW29-R18
Sample Date	07/23/03	04/14/04	01/17/05	10/25/05	08/10/06	08/10/06	08/10/06	05/07/07	01/28/08	10/21/08	07/22/09	04/27/10	01/25/11	10/17/11
Chemical Name														
Volatile Organic Compounds (UG/L)														
1,1,1-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U	5 U	1 U	5 U	0.25 U	0.5 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	1.2	0.39 J	9.8	0.49 J	10 U	10 U	10 U	10 U	10 U	5 U	1 U	5 U	2 U	0.518 J
1,1-Dichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U	5 U	1 U	5 U	0.125 U	0.5 U
1,1-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U	5 U	1 U	5 U	0.5 U	0.5 U
1,2,3-Trichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA	NA	NA	3 J	3 J	NA	NA	NA	NA	NA
2-Hexanone	5 R	5 U	5 U	5 U	10 U	10 U	10 U	10 U	10 U	5 U	5 U	5 U	2.5 U	2.5 U
4-Methyl-2-pentanone	5 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	10 U	5 U	0.67 J	5 U	2.5 R	2.5 U
Acetone	5.6 B	5 U	5 U	5 UL	10 UJ	10 UJ	10 UJ	10 U	3 B	20 U	27 B	12.4 B	13.8 L	3.53 B
Bromodichloromethane	0.5 UJ	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U	5 U	1 U	5 U	0.25 U	0.5 U
Carbon disulfide	5.9 B	0.5 U	0.5 UJ	0.5 U	10 U	10 U	10 U	10 U	10 U	5 U	1 U	5 U	0.5 U	0.5 U
Carbon tetrachloride	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U	5 U	1 U	5 U	0.25 U	0.5 U
Chlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U	5 U	1 U	5 U	0.125 U	0.5 U
Chloroform	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U	5 U	1 U	5 U	0.125 U	0.5 U
Chloromethane	0.5 U	0.4 B	0.5 UJ	0.5 U	10 U	10 U	10 U	10 U	10 U	5 U	1 U	5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	3.3	2.5	3.3 B	4.5	2 J	2 J	3 J	3 J	3 J	2.7 J	1.8	3.09 J	2.88 J	2.29
Dichlorodifluoromethane (Freon-12)	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U	5 U	1 U	5 U	0.25 U	1 U
Methylene chloride	0.76 B	0.5 U	0.67 B	0.87	1 B	1 B	1 B	10 U	10 U	5 U	1 U	0.28 B	0.25 U	1 U
Tetrachloroethene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U	5 U	1 U	5 U	0.25 U	0.5 U
Toluene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U	5 U	1 U	5 U	0.25 U	0.5 U
trans-1,2-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U	5 U	1 U	5 U	0.25 U	0.5 U
Trichloroethene	0.47 J	0.5 U	0.6 B	0.44 J	10 U	10 U	10 U	10 U	10 U	5 U	0.33 J	0.389 J	0.425 J	0.345 J
Trichlorofluoromethane (Freon-11)	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U	5 U	1 U	5 U	0.5 U	1 U
Vinyl chloride	2.2	1.8	0.5 U	3.2 J	3 J	3 J	3 J	3 J	3 J	1.6 J	1.9	4.59	2.71	2.14
Total Metals (UG/L)														
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dissolved Metals (UG/L)														
Aluminum, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Table 3-1
Groundwater Detected Analytical Results from Triquarterly Monitoring Well Network: 2003 to 2011
Interim Remedial Action Completion Report, Site 10, OU-5
Allegany Ballistics Laboratory
Rocket Center, West Virginia

Station ID	10GW30												
Sample ID	AS10-10GW30-R07	AS10-10GW30-R08	AS10-10GW30-R09	AS10-10GW30-R10	AS10-10GW30-R11	AS10-10GW30-R12	AS10-10GW30-R13	AS10-10GW30-R14	AS10-10GW30-R15	AS10-10GW30P-R16	AS10-10GW30-R16	AS10-10GW30-R17	AS10-10GW30-R18
Sample Date	07/25/03	04/14/04	01/17/05	10/25/05	08/10/06	05/07/07	01/28/08	10/21/08	07/22/09	04/27/10	04/27/10	01/25/11	10/17/11
Chemical Name													
Volatile Organic Compounds (UG/L)													
1,1,1-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	5 U	0.25 U	0.5 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	0.5 U	0.5 U	1	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	5 U	2 U	1 U
1,1-Dichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	5 U	0.125 U	0.5 U
1,1-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	5 U	0.5 U	0.5 U
1,2,3-Trichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA	10 U	10 U	NA	NA	NA	NA	NA	NA
2-Hexanone	5 R	5 U	5 U	5 U	10 U	10 U	10 U	5 U	5 U	5 U	5 U	2.5 U	2.5 U
4-Methyl-2-pentanone	5 U	5 U	5 U	5 U	10 U	10 U	10 U	5 U	0.65 J	5 U	5 U	2.5 U	2.5 U
Acetone	4.7 B	4 J	5 U	5 UL	10 U	10 U	4 B	20 U	17 B	10.4 B	9.93 B	15.5 L	3.37 B
Bromodichloromethane	0.5 UJ	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	5 U	0.25 U	0.5 U
Carbon disulfide	11 B	0.5 U	0.5 UJ	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	5 U	0.5 U	0.5 U
Carbon tetrachloride	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	5 U	0.25 U	0.5 U
Chlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	5 U	0.125 U	0.5 U
Chloroform	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	5 U	0.125 U	0.5 U
Chloromethane	0.5 U	0.39 B	0.5 UJ	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	5 U	0.25 U	0.5 U
Dichlorodifluoromethane (Freon-12)	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	5 U	0.25 U	1 U
Methylene chloride	0.75 B	0.5 U	0.52 B	0.5 U	1 B	10 U	10 U	5 U	1 U	5 U	5 U	0.308 J	1 U
Tetrachloroethene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	5 U	0.25 U	0.5 U
Toluene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	5 U	0.25 U	0.5 U
trans-1,2-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	5 U	0.25 U	0.5 U
Trichloroethene	0.5 U	0.5 U	0.8 B	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	5 U	0.25 U	0.5 U
Trichlorofluoromethane (Freon-11)	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	1 U	5 U	5 U	0.5 U	1 U
Vinyl chloride	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	10 U	5 U	1 U	2 U	2 U	0.25 U	0.5 U
Total Metals (UG/L)													
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dissolved Metals (UG/L)													
Aluminum, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium, Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Notes:

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UG/L - Micrograms per liter

Table 3-1
Groundwater Detected Analytical Results from Triquarterly Monitoring Well Network: 2003 to 2011
Interim Remedial Action Completion Report, Site 10, OU-5
Allegany Ballistics Laboratory
Rocket Center, West Virginia

Station ID	2GW03					
Sample ID	2GW3(03)	AS10-2GW03-R11	AS10-2GW03-R12	AS10-2GW03-R13	AS10-2GW03-R17	AS10-2GW03-R18
Sample Date	01/10/03	08/10/06	05/07/07	01/28/08	01/14/11	10/12/11
Chemical Name						
Volatile Organic Compounds (UG/L)						
1,1,1-Trichloroethane	0.5 U	10 U	10 U	10 U	0.25 U	0.5 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	11	4 J	4 J	4 J	3.67 J	5.34
1,1-Dichloroethane	0.5 U	10 U	10 U	10 U	0.125 U	0.5 U
1,1-Dichloroethene	0.5 U	10 U	10 U	10 U	0.5 U	0.5 U
1,2,3-Trichlorobenzene	0.5 U	NA	NA	NA	NA	NA
1,2-Dichloroethene (total)	NA	NA	10 U	10 U	NA	NA
2-Hexanone	5 U	10 U	10 U	10 U	2.5 U	2.5 U
4-Methyl-2-pentanone	5 U	10 U	10 U	10 U	2.5 U	2.5 U
Acetone	2.7 B	10 UJ	10 U	4 B	2.5 R	5 U
Bromodichloromethane	0.5 U	10 U	10 U	10 U	0.25 U	0.5 U
Carbon disulfide	4.1	10 U	10 U	10 U	0.5 U	0.5 U
Carbon tetrachloride	0.5 U	10 U	10 U	10 U	0.25 U	0.5 U
Chlorobenzene	0.5 U	10 U	10 U	10 U	0.125 U	0.5 U
Chloroform	0.5 U	10 U	10 U	10 U	0.125 U	0.5 U
Chloromethane	0.5 U	10 U	10 U	10 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	0.5 U	10 U	10 U	10 U	0.25 U	0.5 U
Dichlorodifluoromethane (Freon-12)	0.5 U	10 U	10 U	10 U	0.25 U	1 U
Methylene chloride	1.3 B	1 B	10 U	10 U	0.364 B	1 U
Tetrachloroethene	0.5 U	10 U	10 U	10 U	0.25 U	0.5 U
Toluene	0.5 U	10 U	10 U	10 U	0.25 U	0.5 U
trans-1,2-Dichloroethene	0.5 U	10 U	10 U	10 U	0.25 U	0.5 U
Trichloroethene	8.1	12	8 J	14	13	7.41
Trichlorofluoromethane (Freon-11)	0.5 U	10 U	10 U	10 U	0.5 U	1 U
Vinyl chloride	0.5 U	10 U	10 U	10 U	0.25 U	0.5 U
Total Metals (UG/L)						
Barium	160 J	NA	NA	NA	NA	NA
Calcium	62,800	NA	NA	NA	NA	NA
Chromium	1.3 J	NA	NA	NA	NA	NA
Cobalt	2.5 J	NA	NA	NA	NA	NA
Copper	1.7 J	NA	NA	NA	NA	NA
Iron	2,490	NA	NA	NA	NA	NA
Magnesium	8,290	NA	NA	NA	NA	NA
Manganese	3,450	NA	NA	NA	NA	NA
Nickel	2.9 J	NA	NA	NA	NA	NA
Potassium	633 J	NA	NA	NA	NA	NA
Sodium	10,300	NA	NA	NA	NA	NA
Dissolved Metals (UG/L)						
Aluminum, Dissolved	845	NA	NA	NA	NA	NA
Barium, Dissolved	195 J	NA	NA	NA	NA	NA
Calcium, Dissolved	64,400	NA	NA	NA	NA	NA
Chromium, Dissolved	2.1 J	NA	NA	NA	NA	NA
Cobalt, Dissolved	3.7 J	NA	NA	NA	NA	NA
Copper, Dissolved	1.6 J	NA	NA	NA	NA	NA
Iron, Dissolved	6,130	NA	NA	NA	NA	NA
Magnesium, Dissolved	8,550	NA	NA	NA	NA	NA
Manganese, Dissolved	4,110	NA	NA	NA	NA	NA
Nickel, Dissolved	3.7 J	NA	NA	NA	NA	NA
Potassium, Dissolved	913 J	NA	NA	NA	NA	NA
Sodium, Dissolved	10,900	NA	NA	NA	NA	NA
Vanadium, Dissolved	1.4 J	NA	NA	NA	NA	NA

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UG/L - Micrograms per liter

Table 3-2
Groundwater Detected Analytical Results from Extended Five-Year Review Monitoring Well Network: 2003 to 2011
Interim Remedial Action Completion Report, Site 10, OU-5
Allegany Ballistics Laboratory
Rocket Center, West Virginia

Station ID	10GW02					10GW07					10GW08				
Sample ID	AS10-10GW02-R07	AS10-10GW02-R08	AS10-10GW02-R09	AS10-10GW02-R10	AS10-10GW02-R12	AS10-10GW07-R07	AS10-10GW07-R08	AS10-10GW07-R09	AS10-10GW07-R10	AS10-10GW07-R12	AS10-10GW08-R07	AS10-10GW08-R08	AS10-10GW08-R09	AS10-10GW08-R10	AS10-10GW08-R12
Sample Date	07/24/03	04/14/04	01/17/05	10/25/05	05/07/07	07/24/03	04/14/04	01/17/05	10/25/05	05/07/07	07/24/03	04/14/04	01/17/05	10/25/05	05/07/07
Chemical Name															
Volatile Organic Compounds (UG/L)															
1,1,1-Trichloroethane	0.5 U	0.5 U	1.7	0.5 J	1 J	1.2	0.64	0.92	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	0.5 U	0.5 U	0.5 U	0.63	10 U	7,100 J	190	350	8,900 L	120	0.5 U	1.2	0.5 U	2.4	3 J
1,1-Dichloroethane	0.5 U	0.5 U	0.8	0.48 J	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U
1,1-Dichloroethene	0.5 U	0.5 U	1.3	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U
1,2,3-Trichlorobenzene	0.5 U	0.67	0.5 U	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA
1,2,4-Trichlorobenzene	0.5 U	0.41 J	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U
1,2-Dichloroethene (total)	NA	NA	NA	NA	44	NA	NA	NA	NA	10 U	NA	NA	NA	NA	10 U
2-Hexanone	50 R	5 U	5 U	5 U	10 U	1,300 R	5 U	5 U	5 U	10 U	50 R	5 U	5 U	5 U	10 U
4-Methyl-2-pentanone	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	10 U
Acetone	50 R	5 U	5 U	5 UL	10 U	1,300 R	5 U	5 U	5 UL	10 U	6.5 J	5 U	5 U	5 UL	10 U
Carbon disulfide	24 B	0.5 U	0.5 UJ	0.5 U	10 U	32 B	0.5 U	0.5 UJ	0.5 UJ	10 U	15 B	0.5 U	0.5 UJ	0.5 U	10 U
Carbon tetrachloride	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U
Chloroform	6	8.4	8	7.6	3 J	0.49 J	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U
Chloromethane	0.5 U	0.43 B	0.5 UJ	0.5 U	10 U	0.5 U	0.5 U	0.5 UJ	140 L	10 U	0.5 U	0.5 U	0.5 UJ	0.5 U	10 U
cis-1,2-Dichloroethene	16	5.4	15	21	44	1.6	1.2	0.93 B	0.5 UL	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U
Cyclohexane	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 UL	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U
Dichlorodifluoromethane (Freon-12)	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	3.2	0.5 U	120 L	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U
Isopropylbenzene	0.5 U	0.5 U	0.48 J	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U
Methylene chloride	1.2 B	0.5 U	0.55 B	0.74	10 U	0.99 B	1.6 B	0.78 B	180 L	10 U	2.1 B	0.5 U	0.44 B	0.74	10 U
Tetrachloroethene	5.9	3.5	4.1	6.9	3 J	0.5 U	0.5 U	0.9	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U
Trichloroethene	94	47	60 B	81 J	78	30 J	34	80 B	2.2	37	1.2	1.1	1.9 B	5.2	2 J
Trichlorofluoromethane (Freon-11)	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	1.4	3.6	0.5 U	4 J	50	20	67 J	26 J	52

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Table 3-2
Groundwater Detected Analytical Results from Extended Five-Year Review Monitoring Well Network: 2003 to 2011
Interim Remedial Action Completion Report, Site 10, OU-5
Allegany Ballistics Laboratory
Rocket Center, West Virginia

Station ID	10GW21					10GW22					10GW27				
Sample ID	AS10-10GW21-R07	AS10-10GW21-R08	AS10-10GW21-R09	AS10-10GW21-R10	AS10-10GW21-R12	AS10-10GW22-R07	AS10-10GW22-R08	AS10-10GW22-R09	AS10-10GW22-R10	AS10-10GW22-R12	AS10-10GW27-R07	AS10-10GW27-R08	AS10-10GW27-R09	AS10-10GW27-R10	AS10-10GW27-R12
Sample Date	07/24/03	04/14/04	01/17/05	10/25/05	05/07/07	07/24/03	04/14/04	01/17/05	10/25/05	05/07/07	07/25/03	04/14/04	01/17/05	10/25/05	05/07/07
Chemical Name															
Volatile Organic Compounds (UG/L)															
1,1,1-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	12	9.2	49 J	12	10 J	0.5 U	1.1	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U
1,1-Dichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U
1,1-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U
1,2,3-Trichlorobenzene	0.5 U	0.45 J	0.5 U	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA
1,2,4-Trichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U
1,2-Dichloroethene (total)	NA	NA	NA	NA	10 U	NA	NA	NA	NA	10 U	NA	NA	NA	NA	1 J
2-Hexanone	5 R	5 U	5 U	5 U	10 U	5 R	5 U	5 U	5 U	10 U	5 R	5 U	5 U	5 U	10 U
4-Methyl-2-pentanone	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	10 U
Acetone	4.6 B	5 U	5 U	5 UL	10 U	4.9 B	6.1	5 U	5 UL	5 B	4.7 B	3.7 J	5 U	5 UL	10 U
Carbon disulfide	2.3 B	0.5 U	18 B	0.5 UJ	10 U	3.7 B	0.5 U	0.5 UJ	0.5 UJ	10 U	12 B	0.5 U	0.5 UJ	0.5 U	10 U
Carbon tetrachloride	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U
Chloroform	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U
Chloromethane	0.5 U	0.5 U	0.5 UJ	0.5 U	10 U	0.5 U	0.5 U	0.5 UJ	0.5 U	10 U	0.5 U	0.38 B	0.5 UJ	0.5 U	10 U
cis-1,2-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 UL	10 U	0.5 U	0.5 U	0.5 U	0.5 UL	10 U	0.5 U	0.5 U	0.5 U	0.5 UL	1 J
Cyclohexane	0.5 U	0.5 U	0.5 U	0.97 L	10 U	0.5 U	0.5 U	0.5 U	0.5 UL	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U
Dichlorodifluoromethane (Freon-12)	0.5 U	0.5 U	0.5 U	0.45 J	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U
Isopropylbenzene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U
Methylene chloride	0.94 B	1.3 B	0.62 B	0.5 U	10 U	0.95 B	1.4 B	0.53 B	0.5 U	10 U	0.8 B	0.5 U	0.43 B	0.5 U	10 U
Tetrachloroethene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U
Trichloroethene	0.72	0.51	0.99 B	0.8	10 U	0.61	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U
Trichlorofluoromethane (Freon-11)	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U

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UG/L - Micrograms per liter

Table 3-2
Groundwater Detected Analytical Results from Extended Five-Year Review Monitoring Well Network: 2003 to 2011
Interim Remedial Action Completion Report, Site 10, OU-5
Allegany Ballistics Laboratory
Rocket Center, West Virginia

Station ID	10GW28					10GW31						PWA-1			
Sample ID	AS10-10GW28-R07	AS10-10GW28-R08	AS10-10GW28-R09	AS10-10GW28-R10	AS10-10GW28-R12	AS10-10GW31-R07	AS10-10GW31-R08	AS10-10GW31-R09	AS10-10GW31-R10	AS10-10GW31P-R12	AS10-10GW31-R12	AS10-PWA01-R07	AS10-PWA01-R07B	AS10-PWA01-R08	AS10-PWA01-R09
Sample Date	07/23/03	04/14/04	01/17/05	10/25/05	05/07/07	07/25/03	04/14/04	01/17/05	10/25/05	05/07/07	05/07/07	07/24/03	07/29/03	04/14/04	01/17/05
Chemical Name															
Volatile Organic Compounds (UG/L)															
1,1,1-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	2.2	2.1	1.5	1.9
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	0.56	0.5 U	6.5	0.6	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	1.1	1.3	0.86	2.3
1,1-Dichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	1.5	1.7	1.4	2.3
1,1-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	1.2	1.4	0.5 U	3.1
1,2,3-Trichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichloroethene (total)	NA	NA	NA	NA	1 J	NA	NA	NA	NA	10 U	10 U	NA	NA	NA	NA
2-Hexanone	5 R	5 U	5 U	5 U	10 U	5 R	5 U	5 U	5 U	10 U	10 U	5 R	5 R	5 U	5 U
4-Methyl-2-pentanone	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	10 U	10 U	5 U	5 U	5 U	5 U
Acetone	6.7 B	8.1	5 U	5 UL	10 U	4.4 B	3.6 J	5 U	5 UL	10 U	10 U	5 R	5 R	5 U	5 U
Carbon disulfide	6.8 B	0.5 U	0.5 UJ	0.5 U	10 U	12 B	0.5 U	0.5 B	0.5 U	10 U	10 U	6.4 B	6.9 B	0.5 U	0.5 UJ
Carbon tetrachloride	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U
Chloroform	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U
Chloromethane	0.5 U	0.44 B	0.5 UJ	0.5 U	10 U	0.5 U	0.4 B	0.5 UJ	0.5 U	10 U	10 U	0.5 U	0.5 U	0.5 U	0.5 UJ
cis-1,2-Dichloroethene	1.5 J	2.1	2.3 B	2.5	1 J	0.5 U	0.5 U	0.5 U	0.5 UL	10 U	10 U	0.99	0.44 J	0.48 J	0.63
Cyclohexane	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 UJ	0.5 U	0.5 U	0.5 U	10 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U
Dichlorodifluoromethane (Freon-12)	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U
Isopropylbenzene	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U
Methylene chloride	0.92 B	0.5 U	0.66 B	0.5 U	10 U	0.71 B	0.5 U	0.59 B	0.5 U	10 U	10 U	1 B	0.78 B	1.1 B	0.68 B
Tetrachloroethene	1.2	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	9	8.6	7	8.4
Trichloroethene	11	11	16 B	15	9 J	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	29 J	19	12	16 B
Trichlorofluoromethane (Freon-11)	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U

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Notes:

Shading indicates detections

NA - Not analyzed

B - Analyte not detected above the level reported in blanks

J - Analyte present, value may or may not be accurate or precise

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Table 3-2
Groundwater Detected Analytical Results from Extended Five-Year Review Monitoring Well Network: 2003 to 2011
Interim Remedial Action Completion Report, Site 10, OU-5
Allegany Ballistics Laboratory
Rocket Center, West Virginia

Station ID	PWA-1			PWA-2				
Sample ID	AS10-PWA-01-R09B	AS10-PWA01-R10	AS10-PWA1-R12	AS10-PWA02-R07	AS10-PWA02-R08	AS10-PWA02-R09	AS10-PWA02-R10	AS10-PWA2-R12
Sample Date	01/31/05	10/25/05	05/07/07	07/24/03	04/14/04	01/17/05	10/25/05	05/07/07
Chemical Name								
Volatile Organic Compounds (UG/L)								
1,1,1-Trichloroethane	3	1.5 J	10 U	1.2	1.3	1.8	0.85 J	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	4.6	1.2 J	1 J	3.1	1.9	5.3	2.3	2 J
1,1-Dichloroethane	3.5	2.2	1 J	0.5 U	0.5 U	0.43 J	0.5 U	10 U
1,1-Dichloroethene	7.5	2	1 J	0.5 U	0.5 U	1.2	0.5 U	10 U
1,2,3-Trichlorobenzene	0.5 U	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA
1,2,4-Trichlorobenzene	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U
1,2-Dichloroethene (total)	NA	NA	10 U	NA	NA	NA	NA	1 J
2-Hexanone	5 U	5 U	10 U	13 J	5 U	5 U	5 U	10 U
4-Methyl-2-pentanone	5 U	5 U	10 U	3.8 J	5 U	5 U	5 U	10 U
Acetone	5 U	5 UL	10 U	4.5 J	5 U	5 U	5 UL	10 U
Carbon disulfide	0.5 UJ	0.5 U	10 U	2.4 B	0.5 U	3.6 B	2 J	10 U
Carbon tetrachloride	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.39 J	0.5 U	10 U
Chloroform	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U
Chloromethane	0.5 UJ	0.5 U	10 U	0.5 U	0.39 B	0.5 UJ	0.5 U	10 U
cis-1,2-Dichloroethene	1.1	0.64	10 U	1.8	1.5	2.3 B	1.8 L	1 J
Cyclohexane	0.5 U	0.5 UL	10 U	0.5 U	0.5 U	0.5 U	1.1 L	10 U
Dichlorodifluoromethane (Freon-12)	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U
Isopropylbenzene	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U
Methylene chloride	0.5 UJ	0.83	10 U	0.96 B	1.1 B	0.47 B	0.7	10 U
Tetrachloroethene	11	8 J	9 J	14	7	11	15	10
Trichloroethene	21	16	14	4.2	1.7	2.5 B	2.6	2 J
Trichlorofluoromethane (Freon-11)	0.5 U	0.5 U	10 U	4	0.5 U	0.59	1.2	10 U

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Notes:

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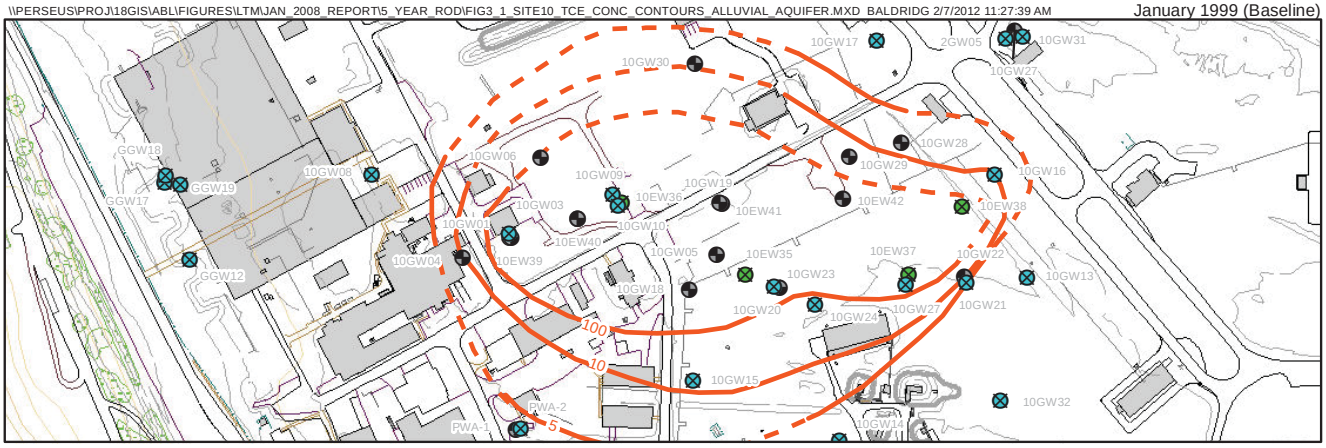
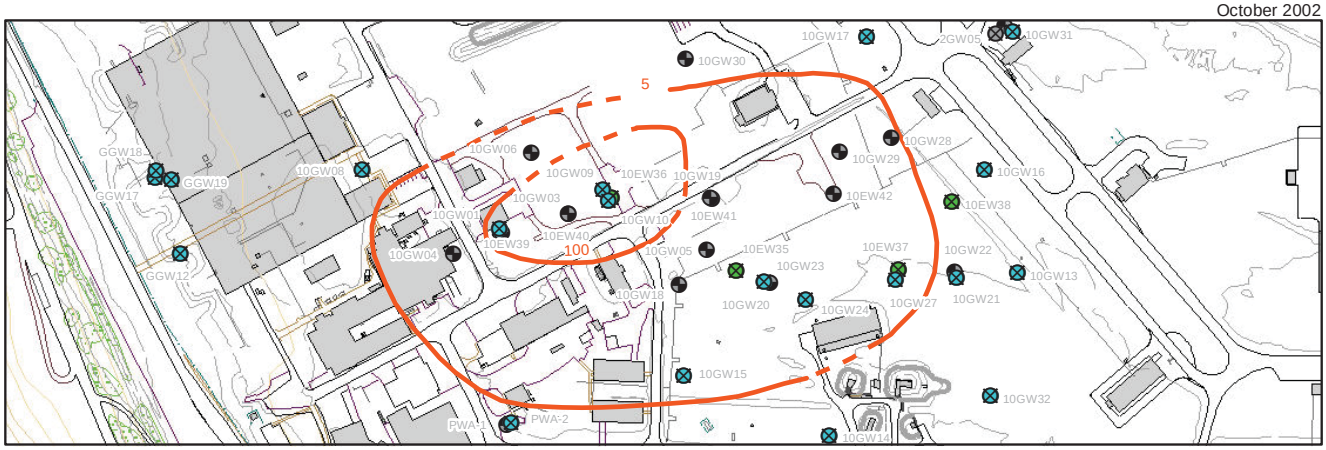
UG/L - Micrograms per liter

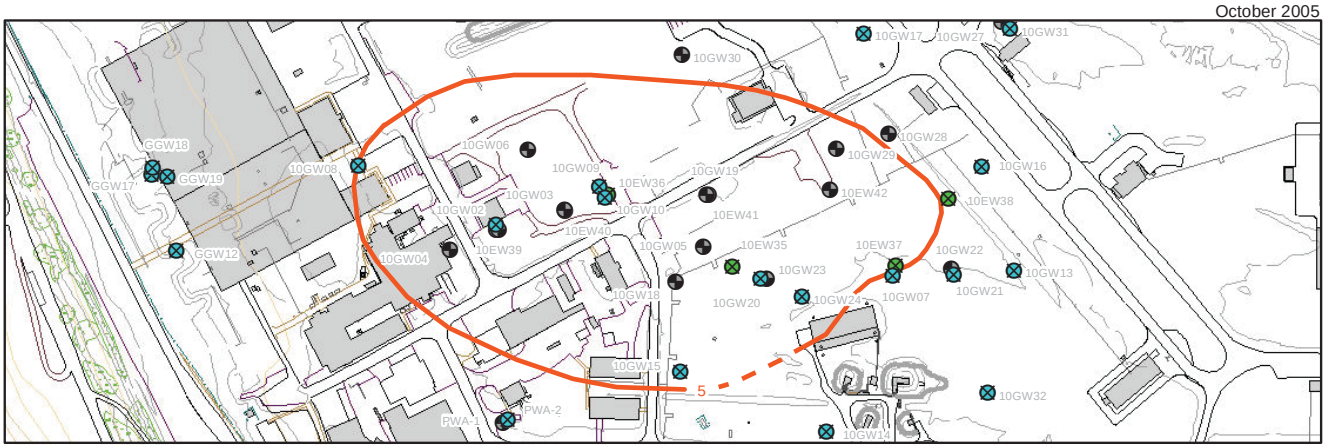
January 1999 (Baseline)



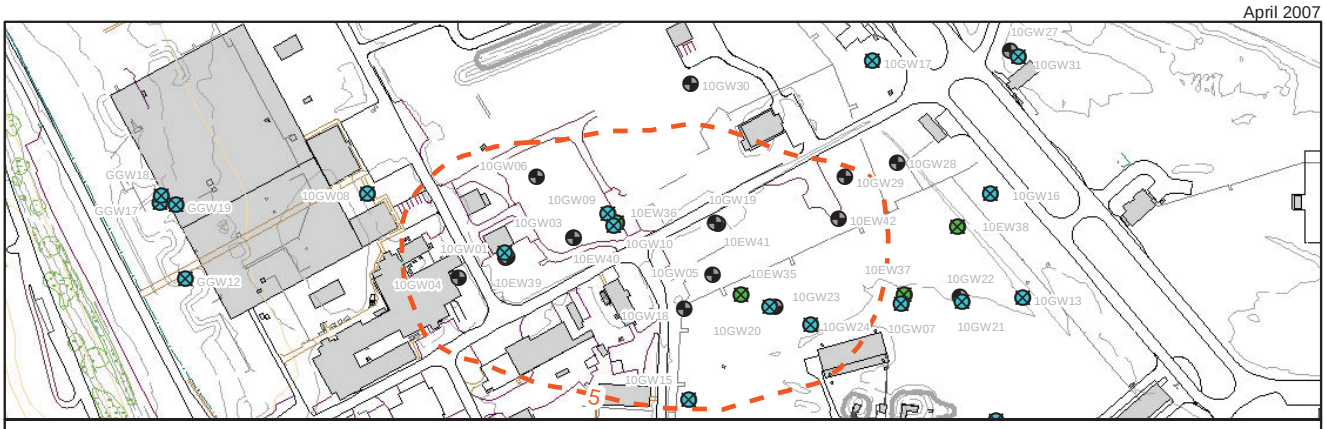
October 2002



October 2005



April 2007



Legend

- Extraction Well - Alluvial
- Monitoring Well - Alluvial
- Extraction & Monitoring Well - Bedrock
- TCE Isoconcentration Line in ug/L
- TCE Isoconcentration Line in ug/L (Inferred)

N
W E
S

0 175 350 700 Feet

Reference: *Final Comprehensive Five-Year ROD Review Report, Third Five-Year Review,* Allegany Ballistics Laboratory, Rocket Center, West Virginia. August 2008.

Figure 3-1
Site 10 TCE Concentration Contours, Alluvial Aquifer
January 1999 (Baseline) through April 2007
Interim Remedial Action Completion Report Site 10, OU-5
Allegany Ballistics Laboratory
Rocket Center, West Virginia

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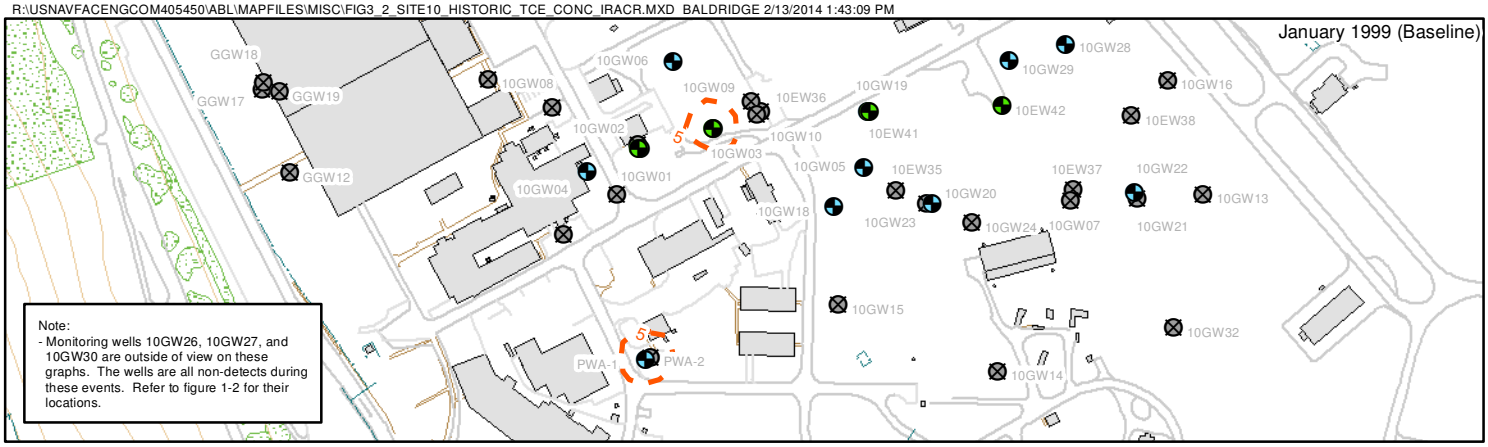

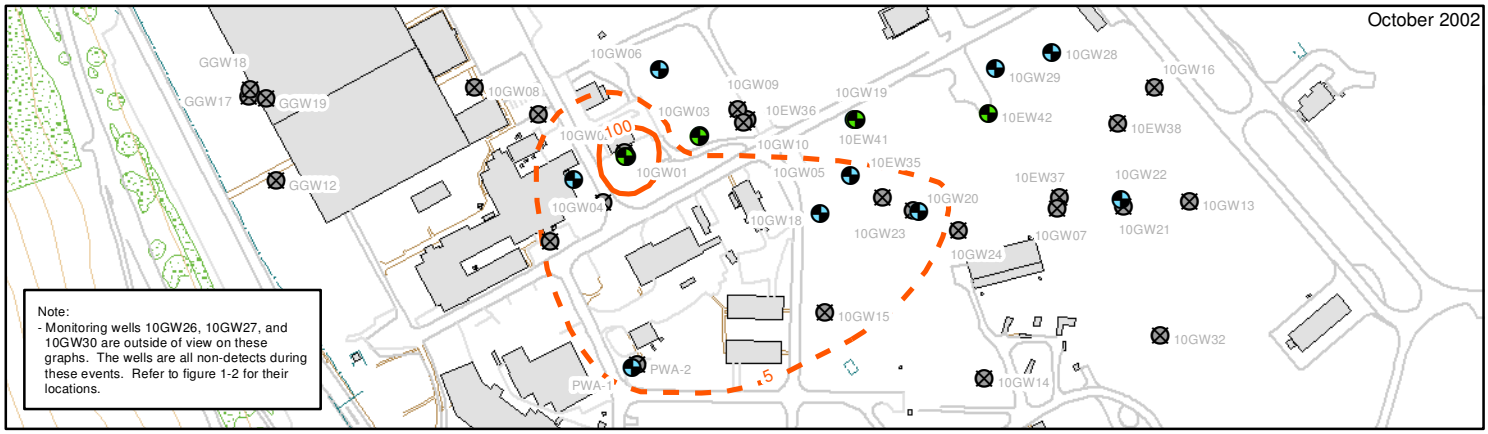

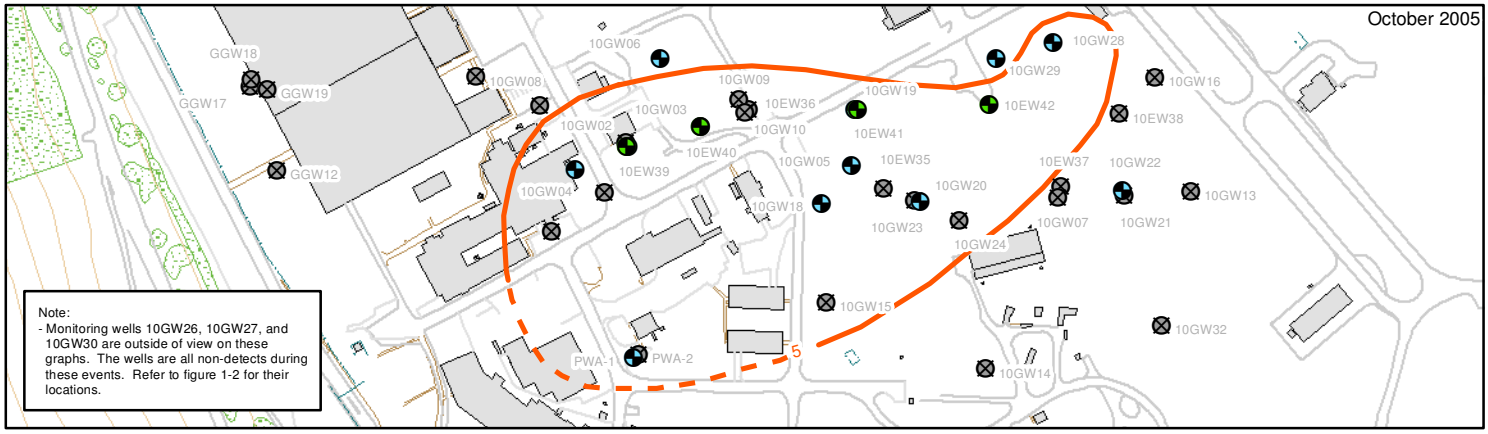

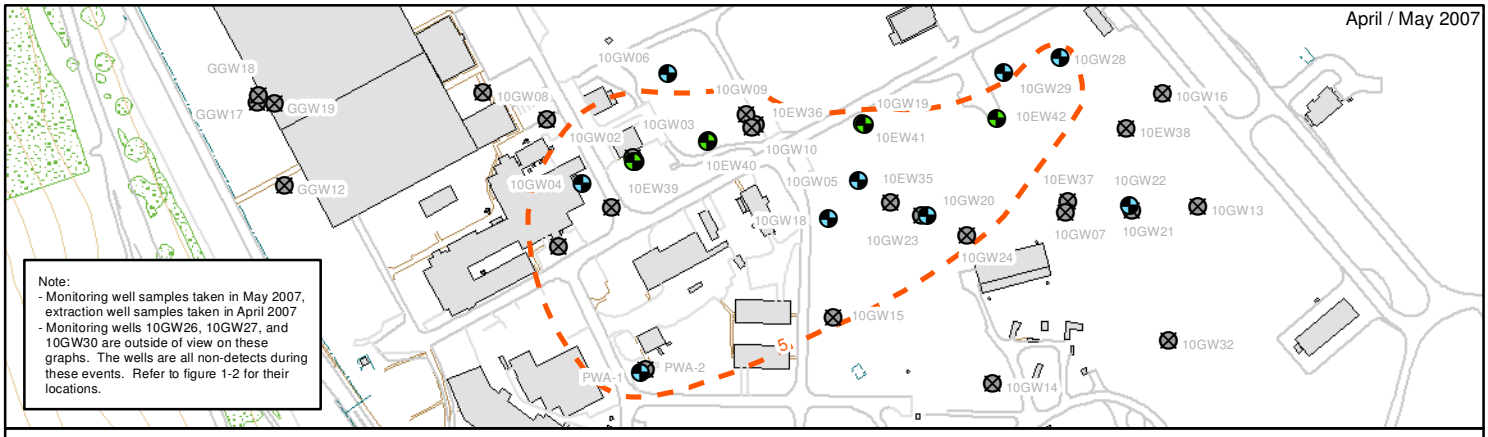

Legend

- Extraction Well - Bedrock
- Monitoring Well - Bedrock
- Extraction & Monitoring Well - Alluvial
- TCE Isonconcentration Line in ug/L
- TCE Isonconcentration Line in ug/L (Inferred)

N W E S

0 175 350 700 Feet

Reference: *Final Comprehensive Five-Year ROD Review Report, Third Five-Year Review,* Allegany Ballistics Laboratory, Rocket Center, West Virginia. August 2008.

Figure 3-2
Site 10 TCE Concentration Contours, Bedrock Aquifer
January 1999 (Baseline) through April/May 2007
Interim Remedial Action Completion Report
Site 10 Groundwater, OU5
Allegany Ballistics Laboratory, West Virginia

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FIGURE 3-3
TCE Concentrations in Alluvial Groundwater at Site 10
Interim Remedial Action Completion Report Site 10, OU-5
Allegany Ballistics Laboratory
Rocket Center, West Virginia

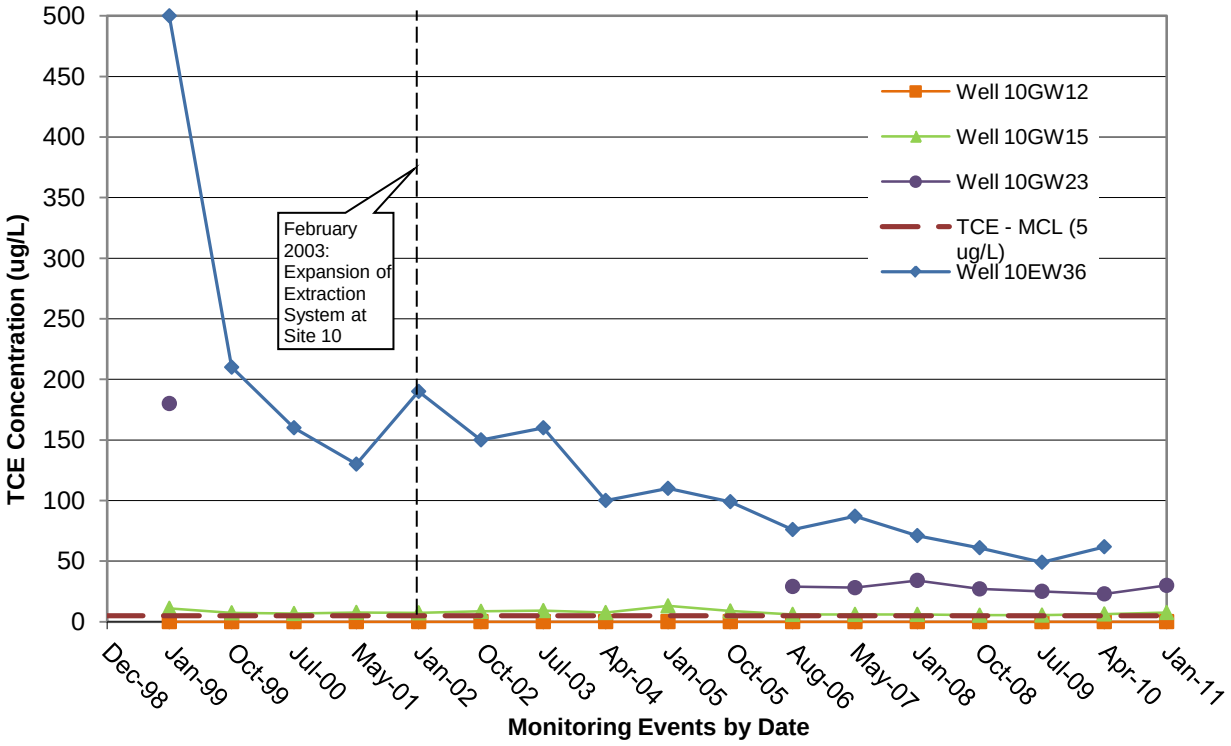
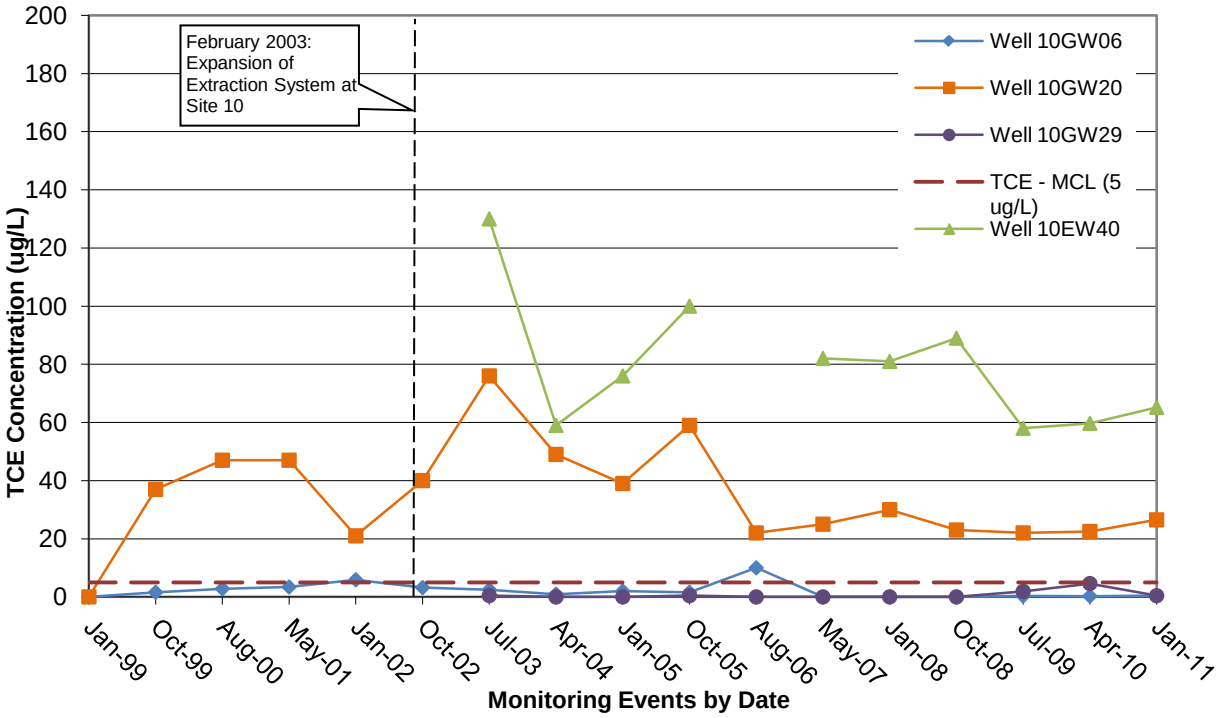


FIGURE 3-4
TCE Concentrations in Bedrock Groundwater at Site 10
Interim Remedial Action Completion Report Site 10, OU-5
Allegany Ballistics Laboratory
Rocket Center, West Virginia



SECTION 4

Achievement of Remedial Action Objectives

The RAOs for Site 10 OU-5 are discussed in Section 2. To date, the construction phase of the remedial action has been completed. LTM is ongoing and LUCs are in place to prohibit the onsite use of groundwater (CH2M HILL, 2013a). Groundwater sampling results are documented in tri-quarterly LTM Reports. None of the RAOs have been achieved; however, significant progress has been made and LTM will continue until all RAOs are achieved. In the alluvial aquifer, the TCE plume has shown a reduction in size in comparison to the Baseline sampling event. In the bedrock aquifer, the TCE plume increased in size from the Baseline sampling event to the October 2005 sampling event, with sampling from April/May 2007 indicating a slight reduction in plume size (**Figures 3-1** and **3-2**). According to the monthly water level maps from March and April 2012 (Appendix A), capture was achieved in the Site 10 alluvial aquifer; however, capture was not achieved for the Site 10 bedrock aquifer. The operations and maintenance team conducted analyses of the lack of capture in the Site 10 bedrock aquifer and recommended that the bedrock extraction wells and lateral header pipes leading to the treatment plant be cleaned. The extraction wells were cleaned in May/June 2012 and the lateral header pipe for 10EW41 and 10EW42 was cleaned in first quarter 2013 and capture has improved although periodic capture loss continues to occur. Efforts to evaluate and correct bedrock capture loss are ongoing. According to the ROD for Site 10, the extraction system is expected to operate for at least 30 years to reach acceptable groundwater chemical levels. The effectiveness of the remedy will continue to be evaluated as LTM data is collected and formally assessed during each 5-year review.

Details of the implementation and performance of the remedy at Site 10 are documented in the Final Five-Year ROD Review Report (CH2M HILL, 2013b). Groundwater results are documented in periodic LTM Reports. **Table 5-1** provides a description of the remedial objectives through a comparison of RAOs and LUC objectives for Site 10 to the results of the RA.

TABLE 4-1
Demonstration of Groundwater Remedial Action Towards Attainment of Remedial Objectives
Interim Remedial Action Completion Report, Site 10, OU-5
Allegany Ballistics Laboratory
Rocket Center, West Virginia

RAOs and LUC Objectives	Remedial Action Results
Prevent or minimize exposure of potential future on-site residents and construction workers to contaminated groundwater originating from Site 10	The remedy at Site 10 OU-5 consisting of the existing groundwater extraction and treatment system is protective of human health and the environment and is expected to continue to be protective in the future. Exposure pathways that could result in an unacceptable risk are being controlled through a combination of the groundwater extraction system and LUCs (CH2MHILL, 2013a).
Achieve the chemical-specific MCL for TCE, where practical	TCE concentrations have decreased steadily in the alluvial and bedrock aquifers since the startup of the groundwater extraction system, however, concentrations remain above MCL (5µg/L).

SECTION 5

Ongoing Activities

Groundwater treatment systems operation and maintenance (O&M) is conducted in accordance to the *Final Environmental Facility User Manual for Groundwater Remediation – Site 1 Northern Riverside Waste Disposal Area, Volumes 1 through 4* (OHM, 1999). Since groundwater extracted from Site 10 is treated at the Site 1 groundwater treatment plant, some O&M activities are associated with both sites. The O&M activities solely associated with Site 10, OU-5 consist of:

- Inspection and maintenance of groundwater extraction wells to ensure that they are capable of meeting pumping rates and other required set points.

The Site 10 extraction system is expected to operate for at least 30 years to reach acceptable groundwater levels. The progress toward meeting the assumed timeframe is periodically evaluated. This evaluation includes consideration of other remedial technologies and effective and efficient operation of the existing remedy.

The Navy will continue to inform the EPA and WVDEP of the post-ROD LTM activities in accordance with the *Final Long-Term Monitoring Plan for Sites 1, 5, and 10* (CH2M HILL, 2011) and statutory 5-Year Reviews will be conducted to ensure the remedy continues to provide adequate protection to human health and the environment. Institutional controls will be maintained until RAOs for OU-5 are met and the concentrations of hazardous substances in the groundwater are at such levels to allow unrestricted use and exposure. Additionally, groundwater LTM will continue to evaluate the effectiveness of the remedy and monitor the site COC concentrations. The groundwater monitoring locations and frequency of sample collection will be periodically evaluated and modifications to the LTM Plan will be made as deemed necessary based on results.

Initial review of the data suggests that the remedy is working. Monitoring of the remedy will proceed and its continued efficacy will be documented in the monitoring reports. The partnering team will continue to use the data and reports to assess the need for additional remedial actions. The protectiveness of the remedy will be reevaluated informally on a continual basis as LTM data are generated and formally reviewed during each 5-year review.

5.1 Five-Year Review

In accordance with Section 121(c) of CERCLA and the National Oil and Hazardous Substance Pollution Control Contingency Plan at 40 CFR Section 300.430(f)(4)(ii), because the selected remedy will result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted access, statutory 5-year reviews will be conducted to ensure that the remedy is, or will be, protective of human health and the environment. Reviews will continue every five years until RAOs are achieved and the site is acceptable for unrestricted use. The next 5-year review is scheduled for 2018.

SECTION 6

Conclusions

The current Site 10 extraction well network configuration was completed and brought online in 2003. The remedy for Site 10 OU-5 is functioning as intended by the ROD with the prevention of continued movement of the most contaminated groundwater at Site 10. Routine maintenance, including inspection, repair, and replacement of the mechanical equipment at the extraction wells, and non-routine maintenance, including extraction well and header pipe rehabilitation, is conducted regularly to ensure continued operation of the treatment system. Additional analytical and hydraulic data through long-term monitoring is required to perform a more comprehensive analysis of the RA's effectiveness in meeting the MCL cleanup goal for VOCs.

SECTION 7

References

CH2M HILL. 1996. *Phase II Remedial Investigation at Allegany Ballistics Laboratory, Rocket Center, West Virginia Report*. August 1996.

CH2M HILL. 1998. *Record of Decision, Site 10 Groundwater at the Allegany Ballistics Laboratory, Rocket Center, West Virginia*. June 1998.

CH2M HILL. 2005a. *Final Record of Decision, Site 10: Former TCE Still and Plant Production Wells "A" and "C" Groundwater (Operable Unit 5) at the Allegany Ballistics Laboratory, Rocket Center, West Virginia.* August 2005.

CH2M HILL. 2005b. *Final Construction, Excavation and Groundwater Use Restriction Plan for Installation Restoration Program Sites, Allegany Ballistics Laboratory, Rocket Center, West Virginia.* February 2005.

CH2M HILL. 2006. *Final Long-Term Monitoring Plan for Sites 1, 5, and 10, Allegany Ballistics Laboratory, Rocket Center, West Virginia.* June 2006.

CH2M HILL. 2008. *Final Comprehensive Five-Year ROD Review Report, Third Five-Year Review, Allegany Ballistics Laboratory, Rocket Center, West Virginia*. August 2008.

CH2M HILL. 2010. *Final Community Involvement Plan for Allegany Ballistics Laboratory, Mineral County, West Virginia*. April 2010.

CH2M HILL. 2010. *Interim Draft Long-Term Monitoring Report for Sites 1, 5, and 10*, *Allegany Ballistics Laboratory, Rocket Center, West Virginia*. November 2010.

CH2M HILL. 2011. *Final Long-Term Monitoring Plan for Sites 1, 5, and 10, Allegany Ballistics Laboratory, Rocket Center, West Virginia*. January 2011.

CH2M HILL. 2013a. *Final Land Use Control Remedial Design for Site 10: Former TCE Still and Plant Production Wells "A" and "C" Groundwater (Operable Unit 5)*, Allegany Ballistics Laboratory, Rocket Center, West Virginia. May 2013.

CH2M HILL. 2013b. *Final Comprehensive Five-Year ROD Review Report, Fourth Five-Year Review, Allegany Ballistics Laboratory, Rocket Center, West Virginia*. September 2013.

Department of Defense and Environmental Protection Agency. 2006. *Department of Defense and Environmental Protection Agency Joint Guidance, Recommended Streamlined Site Closeout and NPL Deletion Process for DoD Facilities.* January 2006.

OHM. 1999. *Final Environmental Facility User Manual for Groundwater Remediation – Site 1 Northern Riverside Waste Disposal Area, Volumes 1 through 4.* 1999.